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HUTCHINS (L. M.). **Diseases and the forest.**—*Yearb. Agric. U.S. Dep. Agric., 1949*, pp. 443–445, 1949.

In this brief, popular survey of forest pathology in the United States it is noted that since the turn of the century more than 25 new diseases of forest trees have been recorded in the country. Of those introduced from abroad chestnut blight [*Endothia parasitica*: *R.A.M.*, 28, p. 200], white pine blister rust [*Cronartium ribicola*: ibid., 28, p. 258], and Dutch elm disease [*Ceratostomella ulmi*: ibid., 28, p. 257] are the most serious. The most destructive, presumably native diseases that have become epidemic include phloem necrosis of elm [ibid., 28, p. 256], little leaf of shortleaf pine [*Pinus echinata*: ibid., 28, p. 366], and pole blight of western white pine [*Pinus monticola*: ibid., 28, p. 259]. The greatest damage, however, is caused by relatively inconspicuous diseases, such as heart rots [ibid., 27, p. 342], which are responsible for annual saw-timber losses of 1,500,000,000 board ft.

It appears that thorough eradication has eliminated larch canker [*Dasyscypha willkommii*: ibid., 27, p. 503] from the limited area in Massachusetts where it recently appeared.

MILLER (P. W.) & SCHUSTER (C. E.). **Walnut tree decline and loss in the Pacific Northwest.**—*Sta. Bull. Ore. agric. Exp. Sta.* 453, 20 pp., 8 figs., 1948. [Received October, 1949.]

In this bulletin, most of which has already been noticed [*R.A.M.*, 28, p. 94], the author states that most of the organisms causing wood rots of walnut trees in Oregon enter the tissues through injuries due to pruning, careless cultivation, cold, sunscald, wind, or ice storms. Pruning cuts should therefore be made close to the main branch to expedite healing, care should be taken not to tear the bark when removing limbs, and all large wounds should be painted with 1 lb. commercial Bordeaux powder mixed in 1 qt. raw linseed oil after they have dried out.

LUTTRELL (E. S.). **Horse-Chestnut anthracnose in Missouri.**—*Plant Dis. Reptr*, 33, 8, pp. 324–327, 1949. [Mimeographed.]

Anthracnose (*Glomerella cingulata*) was observed in 1947 on a 12- to 15-year-old horse-chestnut tree (*Aesculus hippocastanum*) on the University of Missouri campus. Lesions appeared on the leaves in June, causing severe defoliation by September. They consisted of elongated, brown, necrotic areas closely limited to the major veins of the leaflets. Similar sunken, brown lesions developed on the petioles. The infected leaves fell, or only the leaflets dropped leaving the dead petioles attached to the branches. The defoliated branches were often killed back from the tips, this die-back progressing during succeeding seasons. Depressed cankers formed on the larger branches. Large, vertically elongated cankers were present on the trunk.

Both the conidial and perithecial states were constantly associated on infected petioles. All isolates from conidia, ascospores, or infected tissue produced both conidia and ascospores in culture. The perithecia on overwintered petioles were empty and partially disintegrated in the spring, so that the fungus probably overwinters as mycelium in infected branches, the primary source of inoculum being conidia produced on these branches the following spring. Several small buckeye chestnut (*A. octandra*) trees in the vicinity showed mild symptoms of the same disease.

GRASSO (V.). **L'Oidio dell'Eucalipto.** [*Oidium* of Eucalyptus.]—*Nuovo G. bot. ital.*, N.S., 55, 4, pp. 581–584, 2 figs., 1948.

In July, 1947, the author observed a powdery mildew (? *Oidium eucalypti*) on both leaf surfaces and growing points of potted *Eucalyptus rostrata* seedlings in a nursery at Pistoia. The loose, hyaline hyphae measured 6 to 7 μ in diameter, the simple, hyaline, erect, three-to-four septate conidiophores up to 12 or 13 μ long, the truncated conidia bearing an annular constriction at the extremity measuring 22 to 27 by 14 to 18 μ. The condition grew worse on repotted plants kept in the greenhouse; it finally disappeared from those put outdoors, but reappeared in October when brought in again.

PIRONE (P. P.). **Mimosa wilt found in New Jersey.**—*J. N.Y. bot. Gdn*, 50, 598, pp. 226–229, 4 figs., 1949.

In July, 1949, the author isolated *Fusarium oxysporum* f. *perniciosum* [*R.A.M.*, 28, p. 603] from a diseased *Albizzia julibrissin* tree at Cape May, New Jersey, this being the first record of its occurrence in the State. It appears that the disease has been present in the vicinity for several years.

GARREN (K. H.). **Leader dieback—a 'new' disease of Sweetgum.**—*Plant Dis. Reptr*, 33, 9, pp. 351–353, 1949. [Mimeographed.]

In 1948 a serious die-back of unknown etiology was observed on sweet gums (*Liquidambar styraciflua*) at Fort Benning, Georgia, and in a large area in east-central Alabama. In 1949 the disease was more widespread. The die-back appears to be more prevalent and more destructive on younger trees, starting in the terminal portion of the leaders. The first symptoms are sparseness and premature colour changes in foliage. The tips of the branches are bare and remain so the next season. The outer bark is markedly necrotic with scattered open lesions. Inner bark and outer sapwood exhibit blue to black streaks. Necrosis progresses downward, involving successively lower branches. On older trees the die-back occurs in scattered groups of secondary branches near the apex of primary branches, and develops similarly.

Of the fungi isolated from diseased tissues, a species of *Diplodia* (25 per cent.), (?) *Xylaria multiplex* (10 per cent.), and a species of *Graphium* (10 per cent.) were the most frequent.

MÜLDER (D.). **Bekämpfung des Rindenblasenrostes (Peridermium pini).** [Control of bark blister rust (*Peridermium pini*).]—*Forst u. Holz*, 4, 11, pp. 149–153, 1949.

The available information concerning the life-history of *Peridermium pini* [*R.A.M.*, 25, p. 373] and its distribution in German forests [ibid., 18, p. 73] is recapitulated and discussed, with special reference to its control by appropriate silvicultural methods. Regular systematic searches for concealed foci of spore infection are essential to arrest the spread of the disease.

Francke-Grosmann (H[elene]). **Rotfäule und Riesenbastkäfer, eine Gefahr für die Sitkafichte auf Öd- und Ackerlandaufforstungen Schleswig-Holsteins.** [Red rot and giant bark beetle, a threat to the Sitka Spruce in afforestations on waste and arable land in Schleswig-Holstein.]—*Forst u. Holz*, 3, 23, pp. 232–235, 1948.

Forty-year-old Sitka spruce (*Picea sitchensis*) trees in afforestations on waste and arable land in Schleswig-Holstein are subject to severe infection by root rot (*Fomes annosus*) [*R.A.M.*, 23, p. 418], often involving 40 per cent. and upwards of the stands. They react much more intensively to attack by the fungus than do the native spruces (*P. abies*), which frequently show no external symptoms beyond a basal thickening even after years of infection. In the case of *P. sitchensis*, the invasion of a single main root is followed by a spontaneous exudation of resin drops on the bark of the trunk and thinning of the crown. In this state the trees afford the giant bark beetle (*Dendroctonus micans*) optimum conditions for existence and reproduction. In fact, the susceptibility of Sitka spruce to *F. annosus* constitutes a primary factor in the excessive multiplication of the beetles on these trees. Ruthless felling at the first sign of infection is essential to prevent calamitous outbreaks of the insect pest—an economically defensible measure since trees of the susceptible age have commonly obtained a diameter of 40 to 60 cm. at breast height.

Zycha [H.]. **Ist die Douglasie gefährdet?** [Is the Douglas Fir threatened?]—*Forst u. Holz*, 3, 23, pp. 231–232, 1948.

The symptoms of the destructive Douglas fir [*Pseudotsuga taxifolia*] diseases caused by *Rhabdocline pseudotsugae* and *Phaeocryptopus gaeumanni* in Germany [*R.A.M.*, 18, p. 425] and the life-histories of the pathogens are briefly described in semi-popular terms. The alarm experienced on the detection of the former pathogen about 1930 has been somewhat allayed by the discovery that the green (*viridis*) form of the fir is resistant, in contrast to the grey (*glauca*) and blue (*caesia*) [ibid., 18, p. 3]. *P. gaeumanni* is reported to be responsible for heavy depredations near Oldenburg, where a 40-year-old stand, which apparently contracted infection in 1941, has been decimated and is unlikely to produce any more new growth.

Lagerberg (T.). **Some notes on the Phacidiaceae and a new member of this family, Lophophacidium hyperboreum nov. gen. et sp.**—*Svensk bot. Tidskr.*, 43, 2–3, pp. 420–437, 5 figs., 1949.

The pine snow blight fungus, *Phacidium infestans* [*R.A.M.*, 28, p. 495], is generally confined to pine trees in Sweden. It may be transmitted to *Pinus* [loc. cit.], *Picea*, *Abies*, and *Juniperus* spp. when the snow mycelium grows out of infected needles in contact with healthy ones.

A specific spruce (*Picea abies*) snow blight [loc. cit.] distinct from *Phacidium infestans* was probably first observed by the author in Norrbotten during 1910 when he noticed that the needles of a few branches close to the ground were all killed and of a warm brown colour. The disease has since been reported from the most northerly districts of Sweden, to which it appears to be confined, i.e., at Gällivare, Fagerheden, the Muddus National Park, Rahanåive, the Ranesvara Crown Forest, and Arvidsjaur. No attacks appear to be severe enough to interfere with spruce reforestation except at the village of Sarkavara in the Norrbotten Lap district.

The spruce fungus agrees with *P. infestans* in its rhythm of development, and its growth is influenced considerably by snow cover. On one tree all the branches up to about half-way up the trunk were killed and the remaining needles were greyish-white. The following winter there was an additional belt of brown, dead needles indicating the new height to which snow had reached.

An examination of fructifications of the causal fungus received in 1924 indicated that although it belonged to the Phacidiaceae, it differed from the known genera in having a linear stroma and monosymmetric, spool-shaped spores. The fungus is, therefore, designated *Lophophacidium hyperboreum* n.g., n.sp. Brown, slightly raised stromata are found mainly on the underside of the needles, and on these are sparse, irregular, circular or elliptical black spots, 100 to 120 μ wide. In cross section the base of the broad, almost flat, mature stroma is 350 to 500 μ wide. Underneath the hymenium there is a layer of small-celled hyphae measuring 17 to 35 μ in the middle and 7 to 10 μ at the extremities. The asci range from 82 to 114 μ in length and attain a maximum width of 12 to 18 μ a little below the tip. The eight unicellular, fusiform, colourless ascospores measure 16·7 to 22·3 by 4·7 to 7·4 μ and contain abundant oil. The single, thread-like, aseptate paraphyses are 1·8 μ wide in the middle and 1 μ at the top.

ROBAK (H.). **A heterosporous Diplodia sp. isolated from necrotic bark tissue of conifers in western Norway.**—*Svensk bot. Tidskr.*, 43, 2–3, pp. 534–539, 1 fig., 1949.

During 1948 and 1949, a new species of *Diplodia* was isolated from dead branches of spruce (*Picea abies*) and *Abies grandis* affected by die-back at Fana and Os, western Norway. The formation of the conidia and shape of the large A-conidia of this fungus show a marked resemblance to those of *D. pinea* although when the new species was compared with three strains of *D. pinea* from the Centraalbureau voor Schimmelcultures, Baarn, pronounced differences in its appearance and cultural morphology were observed. It also differed in having thin-walled, hyaline B-conidia measuring about 10 by 1 to 1·5 μ. It is concluded that the new species, designated as *D. diversispora* n.sp., is probably closely related to, but not identical with *D. pinea*, and is probably entirely saprophytic.

HAHN (G. G.). **Junipers previously reported blight resistant now proved susceptible to Phomopsis juniperovora.**—*Plant Dis. Reptr*, 33, 8, pp. 328–330, 1949. [Mimeographed.]

In March, 1949, nine potted plants of Dundee juniper (*Juniperus virginiana* var. *hilli*) were wound-inoculated with a pure monospore culture of *Phomopsis juniperovora* [*R.A.M.*, 26, p. 571], a blight-susceptible clone of Berg's variety of *J. virginiana* resistant to rust (*Gymnosporangium juniperi-virginianae*) [loc. cit.] also being inoculated. All ten plants became infected, blight symptoms developing within a week of inoculation. Reinoculations in 1946 of the two specimens of *J. virginiana*, which in 1943 had shown blight-resistance possibilities [cf. ibid., 22, p. 281], showed both to be susceptible.

FÅHRAEUS (G.), NILSSON (R.), & NILSSON (G.). **Studies in the decomposition of wood by means of some white rot fungi.**—*Svensk bot. Tidskr.*, 43, 2–3, pp. 343–356, 4 graphs, 1949.

Experiments were carried out at the Institute of Microbiology, Royal Agricultural College, Uppsala, Sweden, to compare the growth of *Polyporus* [*Polystictus*] *abietinus* [*R.A.M.*, 28, p. 477], *Stereum rugosum*, and *Marasmius scorodonius* on various kinds of sawdust.

An analysis of the residue of birch sawdust six months after inoculation with these fungi showed that a very high percentage of the original material had been consumed. In cultures inoculated with *P. abietinus* 65 per cent. of the lignin and 44 per cent. of the cellulose were consumed after three months; for *S. rugosum* the figures were 54 per cent. lignin and 63·5 per cent. cellulose; and for *M. scorodonius* these figures were somewhat lower since it is primarily a litter-decomposing species.

Determinations of the cellulose content by extracting sawdust with Schweizer's

reagent showed that cellulose could be dissolved only partially from the fresh sawdust but with much greater facility from wood decomposed by *P. abietinus* and *M. scorodonius*.

FINDLAY (W. P. K.). **Decay of timber by fungi.**—*Endeavour*, 8, 31, pp. 112–119, 4 pl. (3 col.), 1949.

The author outlines the historical importance of timber decay and the elaboration of methods for its prevention and discusses means of recognizing the causes of decay, its effects on the properties of wood, the natural durability of wood, preservation with chemicals [*R.A.M.*, 29, p. 1], the prevention of decay in service of timber and logs, and the need for education and development to raise the standard of timber utilization.

BLEW (J. O.). **Comparison of wood preservatives in stake tests.**—*Proc. Amer. Wood Pres. Ass.*, 44, pp. 88–119, 1 fig., 1948.

This is a fully tabulated progress report on a series of stake tests begun by the Forest Products Laboratory in 1938 at various sites in the United States to compare the effectiveness of various wood preservatives [cf. *R.A.M.*, 28, p. 100]. The work must be continued before definite conclusions can be drawn, but the data so far obtained show that untreated 2 by 4 in. stakes (mostly southern yellow pine [*Pinus* spp.] and Douglas fir [*Pseudotsuga taxifolia*]) had an average life of about one year at Barro Colorado Island in the Panama Canal Zone and from two to three years at Saucier, Mississippi, at Jacksonville, Florida, and Bogalusa, Louisiana. Untreated plywood stakes had an average life of one to two years in the Mississippi test, in which plywood stakes having the surfaces impregnated with phenolic resin but untreated cores had an average life of about three and a half years. Additional length of life was provided by protecting the plywood edges with a coating of phenolic resin. Superficial applications of the chemicals (dipping and brushing) provided only limited protection to wood and plywood stakes.

ROBINSON (U. M.). **Laboratory techniques for wood preservative evaluation.**—*Sth. Lumberm.*, 178, 2233, p. 78, 1949.

Many wood preservatives are being tested at the Wood and Paper Division of the Southern Research Institute, using a slight modification of the wood-soil-culture technique [*R.A.M.*, 29, p. 2] developed by the Bell Telephone Laboratories [ibid., 19, p. 127].

The wood-rotting test fungi are allowed to grow in culture for one month on 'feeder strips' on soil in eight-ounce jars about one-third full. Twenty-four 2-cm. sapwood cubes are humidified at 30° C. and 76 per cent. relative humidity and impregnated by means of a special vacuum-pressure cycle with the preservative under test. Two blocks are placed in each of 12 jars and incubated at 27° C. At regular intervals (usually one month) a jar is removed and the loss in weight of the blocks due to decay calculated. Thus a reliable decay-time curve can be plotted and the value of the different preservatives compared.

VERRALL (A. F.). **Decay protection for exterior woodwork.**—*Sth. Lumberm.*, 178, 2237, pp. 74, 76–78, 80, 5 figs., 1949.

Because of the more extensive use of sapwood for exterior woodwork in buildings, the incidence of decay has increased during recent years in the southern United States. Recommendations are given for protection of lumber containing sapwood, with special reference to preservative treatments. The results of tests conducted by U.S. Department of Agriculture in southern Mississippi showed that soaking of pine sapwood joinery for 15, 30, or 60 minutes in 5 per cent. pentachlorophenol [*R.A.M.*,

28, p. 317] (alone or with a moisture repellent) afforded complete protection to exposed, off-the-ground wood for seven years during which time untreated wood developed 42 to 90 per cent. decay. A 30-minute soak in copper naphthenate (2 per cent. copper) allowed decay in one sample in 6·5 years.

HENRY (W. T.) & KEPFER (R. J.). **A new wood preservative.**—*Sth. Lumberm.*, 178, 2237, pp. 46, 48, 1949.

Copperized chromated zinc chloride, an improved form of chromated zinc chloride, containing 73 per cent. zinc chloride, 20 per cent. sodium dichromate, and 7 per cent. cupric chloride, has shown excellent wood-preserving qualities. It resists leaching and the results of two years of exposure tests showed that the corrosion from contact of hardware with treated wood was small and approximately the same as for chromated zinc chloride. The evaluation of copperized chromated zinc chloride is incomplete at present, but in accelerated service stake tests in Alabama and South Carolina the following values have been obtained in comparison with untreated stakes rated at 1·0: copperized chromated zinc chloride (0·85 lb. per cu. ft.) 5·66; chromated zinc chloride (2·5 and 0·75 lb.) 5·33 and 4, respectively; and zinc chloride (0·75 lb.) 2. After 85·5 months' exposure the actual service life of untreated stakes was rated at 100, those of the zinc chloride series 174; the service life to date of the chromated zinc chloride series 233, and copperized chromated zinc chloride 279. The estimated service life for the last two materials is 285 and 519, respectively. The results of strength tests indicate that wood treatment with copperized chromated zinc chloride is not detrimental to the strength characteristics tested.

YOUNG (H. E.). **Bluestain in Hoop Pine logs.**—*Qd J. agric. Sci.*, 5, 3, pp. 125–140, 4 figs., 1948.

This information on bluestain (*Diplodia pinea*) in *Araucaria cunninghamii* has already been noticed from another source [*R.A.M.*, 17, p. 150].

BORACURE (N.Z.) LTD. **The vapour drying and preservative impregnation of structural timber.**—*Aust. Timb. J.*, 15, 2, pp. 94, 97–100, 102, 152, 5 figs., 2 diags., 1949.

An outline is given of the principles of the method of vapour-drying and pressure-vacuum impregnation of New Zealand and Australian indigenous and exotic structural timbers, a method which allows rapid and complete combined treatment in the drying cylinder with minimum handling. The cylinder itself is of standard timber preservation design. Vapours from a distilling hydrocarbon are passed through the cylinder and condense at first, giving up heat to the charge. Air is displaced and the temperature rises steadily to that of the distilling hydrocarbon when condensation ceases and the vapour, passing over the wood at high velocity combined with the relatively high temperature, increases the rate of water diffusion from the wood and its removal from the charge. The vapours from the treating cylinder are partly condensed in a heat-exchanger and the water separated and measured to determine the amount remaining in the wood. The hydrocarbon returns to the still as hot as possible thus making the circulation continuous. Owing to the success of the semi-commercial pilot plant completed in 1947, two full-scale demonstration plants are being erected near Wellington and in Sydney. The lay-out of these plants and the commercial process are described. Approximately one hour of vapour-drying is equal to 24 hours of kiln-drying. In the same container while the timber is hot and under vacuum, impregnation may be carried out and penetration to the full depth of sapwood is obtainable with most preservatives, particularly those soluble in organic liquids. The advantages of this method are its rapidity, low cost, and ability to combine seasoning and preservation.

Kielhöfer (E.). **Die Haltbarkeit von Weinbergspfählen.** [The durability of vineyard stakes.]—*Weinbau*, 2, pp. 292–293, 1947. [Abs. in *Chem. Zbl.*, 118 (ii), 23–24, p. 1192, 1947.]

At the end of a 12-year experiment in a German vineyard, 8·1 per cent. of the untreated stakes were rotten and 53·6 per cent. showing signs of deterioration, whereas those given the full-cell creosote treatment were in perfect condition. Impregnation with creosote in an open tank, kyanization [*R.A.M.*, 19, p. 58] after a preliminary drying, and immersion in copper sulphate resulted in 0·9, 2·7, and 4·5 per cent. rejections, respectively. The omission of drying before kyanization led to 9·1 per cent. deterioration.

Markham (R.), Matthews (R. E. F.), & Smith (K. M.). **Specific crystalline protein and nucleoprotein from a plant virus having insect vectors.**—*Nature, Lond.*, 162, 4107, p. 88, 3 figs., 1 graph, 1948.

Most of this information on turnip yellow mosaic virus has already been noticed from another source [*R.A.M.*, 28, p. 261].

Hörberg (Y.). **Weibulls original Tellus Bortfelder, stam 21.** [Weibulls Original Tellus Bortfelder Turnip, strain 21.]—*Weibulls ill. Årsb.*, 44, p. 27, 1949. [Abs. in *Field Crop Abs.*, 2, 3, pp. 196–197, 1949.]

During 1948, in Örkelljunga and Sörmark in Värmland, Sweden, Tellus strain 21, a green-topped, yellow-fleshed turnip, proved less susceptible to club root [*Plasmodiophora brassicae*: *R.A.M.*, 20, p. 439; 26, p. 518] than Bortfelder. Neither variety should, however, be grown on soils known to be infected, for which only Immuna 11 can be recommended.

Wang (T. M.). **Studies on the mechanism of resistance of cruciferous plants to Peronospora parasitica.**—*Phytopathology*, 39, 7, pp. 541–547, 1 fig., 1949.

Much of the experimental work herein described on the host-parasite relationship of *Peronospora parasitica* [var.] *brassicae* race 2 and *P. parasitica* [var.] *raphani* on *Brassica chinensis*, cabbage, and radish was performed in Chengtu, China, in 1943–4 [*R.A.M.*, 25, p. 379], and part of it was repeated at the University of Nanking in 1947. *B. chinensis* is susceptible to the former and immune from the latter fungus, while a reciprocal relation exists in the case of radish. Cabbage is resistant to both pathogens. All hosts, irrespective of their reaction, are entered by direct penetration through the epidermal cells or by way of the stomata. After penetration the mycelium readily permeates the intercellular spaces of the leaf mesophyll and sends haustoria into the cells of a susceptible host. In resistant and immune plants, on the other hand, mycelial development and haustorial formation are arrested and the surrounding host cells die. The parasites sporulate profusely on susceptible hosts, but on resistant ones they form necrotic spots. Immune plants show no symptoms or bear only a few minute, necrotic spots. Weak light, by permitting somewhat more extensive mycelial development, may transform the immune reaction of a host into a quasi-immune or resistant response [cf. ibid., 11, p. 629; 15, p. 284], while a comparable but weaker effect is exerted by high atmospheric moisture.

Kassanis (B.). **The transmission of Sugar-Beet yellows virus by mechanical inoculation.**—*Ann. appl. Biol.*, 36, 2, pp. 270–271, 1949.

At the Rothamsted Experimental Station when leaves of healthy Kleinwanzleben E sugar beet seedlings were dusted with celite or 400-mesh carborundum and then rubbed with freshly expressed sap from the leaves of sugar beets affected with virus yellows [*R.A.M.*, 28, pp. 370, 501], they became infected. Symptoms developed slowly, local lesions appearing first, after at least two weeks. On some

leaves there were no clearly defined lesions, on others over a hundred. Most of the lesions were small, brown, necrotic spots, but some were purplish. The infected leaves yellowed and became brittle, this in some cases being the only symptom. Sap from yellowed leaves precipitated specifically with antiserum to sugar beet yellows virus, sometimes giving a titre of 1/16.

Most of the inoculated plants developed lesions only on the rubbed leaves, the new growth appearing normal and seemingly virus-free, though about 10 per cent. of the inoculated plants usually became systemically affected after four to six weeks, the symptoms consisting of vein-clearing followed by chlorosis. Three times the number became systemically infected when the plants were placed four days in the dark before inoculation. There were no necrotic local lesions. Sap from leaves of systemically infected plants gave the usual positive precipitin reaction with virus antiserum.

THOMAS (W. D.). **Reaction of different Bean varieties to the Colorado red-node virus.**—*Plant Dis. Reptr*, 33, 6, pp. 244–246, 1949. [Mimeographed.]

The incidence of Colorado red node virus disease [cf. *R.A.M.*, 23, p. 1], affecting field bean plants [*Phaseolus vulgaris*] in this State, has been increasingly prevalent since 1946. In inoculation tests in which the reaction of 17 bean varieties was studied, all, except Kentucky Wonder White No. 780 and Kentucky Wonder Brown No. 814, developed reddening of leaf veins and most had red lesions on stems. Top necrosis occurred on some varieties. Mosaic-resistant Idaho selections occasionally produced pods that exhibited symptoms of shiny pod and Colorado red node simultaneously. Red node symptoms appeared on plants infected with bean mosaic in 1947 and 1948. It is suggested that the Colorado red node virus is probably not a strain of the yellow bean mosaic virus [*R.A.M.*, 28, p. 371].

Notes from Auchincruive—I.—*Scot. Agric.*, 29, 2, pp. 112–114, 1949.

The results of experiments carried out during the last five years at Auchincruive, Scotland, indicate that chocolate spot of [broad] beans [*Botrytis cinerea* and *B. fabae*: *R.A.M.*, 28, p. 372] is not responsible for major yield reductions. In 1944, when all six varieties tested had 90 per cent. infection, the average yield was the second highest of the five-year period and slightly above the average for the whole period. While all varieties reacted similarly when the incidence of the disease was high, varieties B 03 and Tick had consistently the lowest, and B 01 and Carse the highest rates of infection when the incidence was low.

It is suggested that in the absence of early and severe infection failure in bean crops is probably due to other factors. Potassium deficiency, for instance, which increases the severity of chocolate spot, is itself a primary cause of trouble. The disease spreads rapidly when the air is at 100 per cent. humidity for considerable periods.

CIFERRI (R.). **Coesistenza delle Botrytis fabae e B. cinerea sulle piante di Fava.** [Co-existence of *Botrytis fabae* and *B. cinerea* on Broad Bean.]—*Notiz. Malatt. Piante*, [*1949*], 1, pp. 3–5, 1949. [Mimeographed.]

Botrytis fabae is a frequent parasite of broad bean in Mediterranean countries [*C.M.I.* Map No. 162; *R.A.M.*, 28, p. 133]. In Italy, it is almost always found in plantings of broad bean in the centre and south of the peninsula and in the islands, though reported only from Sicily; the author has found it every year in Tuscany, the Marches [central Italy], and Umbria, and has occasionally received material from Liguria, Latium, and the Campagna.

In 1941, from beans purchased in the market at Florence (and probably locally grown) the author isolated *B. fabae* and *B. cinerea*. Young broad bean plants were sprayed with conidial suspensions in water of *B. fabae*, *B. cinerea* (from grape vine

and persimmon), a mixture of conidia of *B. fabae* and *B. cinerea* (bean strain), and *B. cinerea* (bean strain) alone.

The inoculations with *B. fabae* readily reproduced the disease as described by Sardiña, but the grape and persimmon strains of *B. cinerea* appeared to give negative results. *B. cinerea* (bean strain) readily produced blackish-chestnut or blackish-brown spots spreading diffusely from the edges to the middle of the leaves, with spots of the same colour on the leaf stalks and the stems. The affected leaves turned black and rapidly wilted, especially when the stalks were affected. In a few cases, plants with stem infection wilted in three or four days. Inoculations with mixed conidia of *B. fabae* and *B. cinerea* (bean strain) caused both types of spotting on different plants and on one leaf, and in some instances there was superimposed on the more precocious infection of the type caused by *B. fabae* that due, apparently, to *B. cinerea* bean strain. Collapse of the plants appeared to be caused by *B. cinerea*, not *B. fabae*.

Castellani (E.). **Le virosi della Soia.** [Viroses of Soy-Bean.]—Reprinted from *Olearia*, 12, 9 pp., 5 figs., 1948.

Notes, based largely on the literature of the subject, are given on the symptoms, manner of spread, and control of soy-bean mosaic [*R.A.M.*, 28, p. 205], yellow mosaic [bean yellow mosaic virus: loc. cit.], and 'curvatura apicale' [bud blight] due to the tobacco ring spot virus [ibid., 25, p. 484]. Mosaic was observed by the author in 1948 near Florence on plants grown from seed obtained from northern Italy, which suggests that the disease is already widespread in the country; the only symptoms observed on the varieties at Florence (all early), viz., Gessener F_1, Gessener 850, Platter gialla, Kaiser v, J.S. 14, Manchurian, Dieckmann, Cajuga, and 32–34, were a typical yellowish mottling and wavy margins to the leaflets. The affected plants harboured the aphid *Doralis* [*Aphis*] *fabae*, which may possibly be a vector. Yellow mosaic appears to call for no control measures and bud blight has not yet been recorded from Italy.

Weber (G. F.). **Bottom-rot of Celery caused by Corticium vagum B. & C.**—Abs. in *Phytopathology*, 39, 6, p. 500, 1949.

The first symptoms of bottom rot (*Corticium vagum* [*C. solani*: *R.A.M.*, 28, p. 559]), an insidious disease of celery growing in dense stands on wet, highly organic soils, appear on the basal leaflets at the margins, which become wilted, blackened, and wet. Infection progresses towards the midribs and larger veins but is seldom noticeable, except when the secondary petioles and ultimately the main leaf stalk are involved, causing collapse of the entire leaf. At the soil line near the base of the petioles or stalks brown, circular to oval, slightly sunken lesions, up to 1 in. or more in diameter, may be observed on either the inner or outer surface. The epidermis over the discoloured areas is covered by a barely discernible, thin network of closely adhering, intertwined, brown, septate hyphae, which spread over the surrounding uncoloured stalk tissue and often terminate in sclerotioid tufts. The brownish lustre produced by the hyphae on the surface of the petioles, as observed in sunlight on a plant removed from the soil, is intense at soil-level, fading to white several inches above. Within this zone the perfect state of the fungus developed in a white network of superficial hyphae, which gave rise to basidia and basidiospores. On potato dextrose agar the fungus produced typical mycelium and sclerotia.

Smith (P. G.). **A witch's broom disease on Cucumber and Cantaloupe.**—*Phytopathology*, 39, 7, pp. 598–599, 1949.

During the period from December to February, 1944–5, the author observed, in connexion with his work of vegetable production for the armed forces in the South

Pacific area, an unusual and apparently new disease of the Long Green cucumber variety and P.M.R. No. 45 cantaloupe occurring on the island of Espiritu Santo, New Hebrides, and tentatively attributed to a virus.

The general symptoms were of the witches' broom type, the infected portions appearing as a mass composed of numerous flowers and undersized leaves. Early attacks resulted in stunting of the entire plant, with typical symptoms throughout, while in later ones only the subsequent growth was affected. The diseased parts were uniformly green, slightly paler than normal, and the stems were spindly. The internodes were somewhat shortened, and adventitious roots were freely produced by nodes in contact with moist soil. On growth made after infection branches were formed at every node of the primary stems. Three to six flower buds arose from every node on both primary and secondary stems, usually only one flower opening at a time. These symptoms imparted a dense witches' broom aspect to the plants. The petioles seldom exceeded 2 in. in length or the leaf blades $2\frac{1}{2}$ by $1\frac{1}{2}$ in. The pedicels, very slender and weak, measured 1 to $1\frac{1}{2}$ in. in length, and the flowers were abnormal and non-functional, with yellow to greenish-yellow petals, about half the normal size. The proportion of male to female flowers was abnormally high. The former had enlarged sepals, either narrow and strap-shaped or more often leaf-like, with a definite petiole and lanceolate to pointed, ovate blade. The sepals of the female flowers were normal. At flowering time the ovaries were unusually slender, with much reduced spines; after developing up to 1 or $1\frac{1}{2}$ in. they invariably turned yellow and dropped, as did fruit partially grown before the occurrence of infection.

The witches' broom developed only during the above-mentioned summer months, which were virtually free from rain, though the remainder of the year was excessively wet. It would appear, from the great variations in the rainfall of Espiritu Santo and the relative constancy of the mean temperature, that the incidence of the disease is related to the former factor. The presumed insect vector of the virus may have been held in check by the heavy precipitation during most of the year.

Walker (M. N.) & Weber (G. F.). **Diseases of Watermelons in Florida.**—*Bull. Fla agric. Exp. Sta.* 459, 46 pp., 31 figs., 1949.

This bulletin, a revision by G. K. Parris of *Bulletin* 225 [*R.A.M.*, 10, p. 771] describes in popular terms the symptoms and control of the chief watermelon diseases found in the United States and is stated to contain the latest and best information available on the subject, most of which has already been noted from another source [ibid., 28, p. 48].

Anthracnose (*Colletotrichum lagenarium*), the worst disease of melons in the United States, is best controlled by pre-planting seed treatment with semesan, spergon, or arasan (0·3 per cent. by weight), by not entering the melon fields when the foliage is wet with dew or rain, and by timely spraying with dithane or parzate, the first application being made directly the disease appears and followed by others at intervals of seven to ten days according to the weather conditions and the severity of the outbreak.

Losses from *Fusarium oxysporum* f. *niveum* [*F. bulbigenum* var. *niveum*] may be avoided if a 15-year rotation is practised when susceptible varieties are used. Downy mildew (*Peronoplasmopara* [*Pseudoperonospora*] *cubensis*) is controlled by the same materials as anthracnose, though fermate, zerlate, and copper-lime also give fairly good results. If harvested watermelons are handled carefully and quickly, and the stems cut correctly and disinfected with copper sulphate paste, stem-end rot (*Physalospora rhodina*) [ibid., 22, p. 180] transit losses may be considerably reduced. Other diseases discussed are southern blight (*Corticium rolfsii*), blossom-end rot, powdery mildew (*Erysiphe cichoracearum*) [ibid., 27, p. 343], leaf spot due to *Cercospora citrullina* [ibid., 26, p. 266] and *Macrosporium cucumerinum*

[*Alternaria cucumerina*: ibid., 10, p. 771], soil rot (*Corticium vagum*) [*C. solani*], and mosaic [cucumber mosaic virus: ibid., 13, p. 146].

COURTIEU (P.) & CHAPUIS (G.). **Champignons de couche et fumier artificiel.** [Cultivated mushrooms and synthetic manure.]—*C.R. Acad. Agric. Fr.*, 35, 8, pp. 299–303, 1949.

Laboratory experiments carried out over a period of five years in France showed that the use of synthetic manure in mushroom beds [*R.A.M.*, 26, p. 189] yielded an average of 53·3 kg. of mushrooms per ton of manure, the amounts varying from 28·3 kg. to 133·5 kg. according to the source of protein, length of fermentation, which should take place between 60° and 73° C., and physical composition of the manure. These results can be obtained only when the physical, chemical, and microbial composition correspond as closely as possible to that of horse manure. Ammonium sulphate proved the most favourable source of nitrogen. Dried reeds in a 50 : 50 mixture with manure gave a good yield.

HADORN (C.). **Peut-on combattre avec succès une épidémie de rougeot parasitaire dans nos vignobles? Resultats de quatre années d'observations et d'essais pratiques.** [Can an epidemic of 'rotbrenner' in our vineyards be effectively controlled? Results of four years' observations and experiments.]—*Rev. Vitic., Paris*, 93, 7, pp. 195–200, 1 diag., 2 graphs; 8, pp. 231–236, 2 diags., 3 graphs, 1947. [Received June, 1949.]

This information on 'rotbrenner' of vine (*Pseudopeziza tracheiphila*) has already been noted from another source [*R.A.M.*, 26, p. 376].

COUDERC (V.). **Viticulture en sols court-nouants. Rôle de la végétation spontanée.** [Vine-growing in soils giving rise to court-noué. Part played by wild vegetation.] —*Vitic. Arboric., Paris* (formerly *Rev. Vitic., Paris*), 95, 9, pp. 262–263, 1949.

In this concluding article on the part played by wild perennial plants with a well-established root system in regenerating soils giving rise to vine court-noué [cf. *R.A.M.*, 28, p. 319] the author concludes that such plants render the soil more permeable thus encouraging the development of the root system and ameliorating the nutrition and vigour of diseased vines.

COUDERC (V.) & MARSAIS (P.). **La dégénérescence de la Vigne au XX^e^ siècle est une phytopathie édaphique.** [Vine degeneration in the twentieth century is an edaphic disorder.]—*Rev. Vitic., Paris*, 93, 12, pp. 362–363, 1947. [Received June, 1949.]

The authors consider that vine court-noué [see preceding abstract], due primarily to nutrient deficiencies, can be virtually eliminated by applying to the soil heavy applications of organic fertilizers with lime and phosphates to restore it to its normal chemical composition and that diseased vines can be brought into production again by suitable treatment [loc. cit.].

VITORIA (E. R.) & ALCALDO LASSALLE (A. J.). **El 'arrugamiento viroso' de la Vid.** [The 'virus corrugation' of the Vine.]—*Rev. Invest. agric., B. Aires*, 3, 1, pp. 1–26, 7 pl., 1949.

A serious disease of the vine in Mendoza and San Juan, Argentina, designated 'virus corrugation', which has been under investigation since 1941, has been found to be identical with Pierce's disease [lucerne dwarf virus: *R.A.M.*, 29, p. 8]. During the first year of infection apparently normal yields are obtained, but in the second the vines suddenly wither and losses of 50 to 100 per cent. are sustained; they then remain unproductive until the fifth or sixth year, when they die. Control

measures should include, besides the usual sanitary precautions, the cultivation of resistant varieties, e.g., Lactuario, Moscatel, Sanjuanino, Apersogia, Corinta, Gobernador Benegas, Cornichón Violeta, Moscatel de Alejandria, Mavron, and Emperador; the elimination from vineyards of *Convolvulus arvensis*, a suspected host of the virus; and the separation of lucerne crops from vineyards by the maximum distance possible.

The literature on lucerne dwarf virus is reviewed and observations are made on its geographical distribution, economic importance, symptomatology, etiology, mode of propagation, and conditions favouring its occurrence. An appendix comprises suggestions for legislation against the disease.

Baldacci (E.). **Osservazioni sulla sindrome del 'mal nero' della Vite in Calabria.** [Observations on the syndrome of 'mal nero' of Vine in Calabria.]—*Notiz. Malatt. Piante*, [*1949*], 1, pp. 1–3, 1949. [Mimeographed.]

After referring to earlier researches on vine 'mal nero' in Italy [*R.A.M.*, 9, p. 504], the author states that he observed the disease in April and May, 1948, at Cannitello, Commune di Villa S. Giovanni, Calabria. The condition became apparent as soon as growth was renewed. On the affected vines bud opening was retarded, while starting from the apex of the shoot a black spot formed and gradually lengthened out until it covered three-quarters of the shoot. The shoot itself was stunted and the internodes rather short. This spot or streak never occupied the entire circumference of the shoot, and the vegetation which developed later (after about the middle of May) appeared to be normal. The same black spotting was observed on the fruit clusters, which withered up, and in this respect, as in the lesions found in the wood, the disease resembled Baccarini's description of it [cf. ibid., 1, p. 154]. On the wood, black stripes were observed extending from the point of insertion of the old branches towards the base of the trunk. According to the grower, the severity of the symptoms became more marked each year up to the fourth, when the vines ceased to produce new shoots and died. Yield declined annually. The disease appeared locally in 1939–40 and in 1948 covered an area of about 10,000 sq. m., while tending to spread. The affected vines are 10 to 15 years old. Alicante vines grafted on Rupestris du Lot appear to be particularly susceptible, while ungrafted vines are not affected. Similar symptoms were also observed near Etna, in Sicily, on the Nerello variety grafted on Rupestris du Lot.

Inoculations in June, 1948, with sap and with fungi and bacteria from affected branches were negative. At present the etiology of the condition is undetermined; the fact, however, that ungrafted vines are not affected suggests that the condition may originate in some internal incompatibility.

Topi (M.) & Baldacci (E.). **Sul significato della convergenza sintomatologica delle alterazioni da 2–4 D e da roncet (court-noué) nella Vite.** [On the significance of the symptomatological correspondence between the alterations induced by 2,4-D and by roncet (court-noué) in the Vine.]—*Phytopath. Z.*, 15, 3, pp. 393–401, 3 figs., 1949. [English and German summaries.]

Attention is drawn to the striking analogies between the symptoms developing on vines treated with a 2,4-D preparation and those of court-noué [*R.A.M.*, 28, p. 319]. It is argued that viruses, like bacterial and fungal parasites, modify the distribution and operation of the natural auxins in the host in the same way as do synthetic hormone treatments [cf. above, p. 75].

Van der Plank (J. E.). **Vulnerability and resistance to the harmful plant viruses : a study of why the viruses are where they are.**—*S. Afr. J. Sci.*, 46, 2, pp. 58–66, 1949.

In this paper (Presidential Address to Section C of the South African Association

for the Advancement of Science, Kimberley, 4th July, 1949) the author deals with the relation between vulnerability and resistance and its bearing upon the occurrence of the harmful plant viruses. A state of vulnerability means that circumstances are favourable for an attack by any appropriate infections that are about and it is increased by conditions such as longevity, large size [*R.A.M.*, 27, p. 218], and crowding [ibid., 28, p. 50]. Susceptibility is defined as implying harm, and resistance (including tolerance) as the opposite of susceptibility. In nature vulnerability is necessarily accompanied by resistance since ecologically dominant species are generally large, crowded, and perennial and therefore vulnerable, and yet they are more resistant. For example, maize streak virus does not establish itself in local common grasses, nor do the common vegetable viruses commonly attack trees. The resistance of trees is usually adequate to protect them when brought into cultivation unless this includes vegetative propagation. There is no record of virus damage in any forest plantation in South Africa.

General resistance (to all viruses) and special resistance (to some) are distinguished. The virus position of plants in cultivation owing to increased vulnerability and particularly virus diseases of budded or grafted fruit trees and the dangers of vegetative propagation in increasing vulnerability and infection are discussed.

Thung (T. H.). **Grondbeginselen der plantenvirologie.** [Rudiments of plant virology.]—*Meded. LandbHogesch., Wageningen*, 49, 4, 155 pp., 1 col. pl., 19 figs., 4 diags., 1 graph, 1949.

The following lectures, forming part of a course on tropical plant diseases delivered by the author at the Agricultural College, Wageningen, Holland, in 1946, are concerned with viruses. I. The virus, subdivided into (A) the nature of the infective principle and (B) methods of investigation; II. Virus diseases (A) general considerations, (B) methods of investigation; III. Infective principle and the plant (A) synthesis of the virus, (B) transport of the infective principle, and (C) infectivity; IV. Epidemiology; V. Inactivation of viruses; VI. Control of virus diseases (A) general considerations on control and (B) special control projects; and VII. The virus diseases discussed (comprising a list, arranged alphabetically under the Dutch names of the hosts, of those included in the monograph). In conclusion a synopsis is given of the virus diseases of Vorstenland tobacco [*R.A.M.*, 13, p. 806; 19, p. 241], and a 17-page bibliography is appended.

Fernández Valiela (M. V.). **Los virus que afectan a las plantas.** [Viruses that affect plants.]—*Bol. Soc. argent. Bot.*, 3, 1, pp. 1–15, 2 pl., 1949.

Some outstanding contributions to the literature on plant viruses are summarized under various aspects, including symptomatology, virus complexes, modes of transmission and propagation, immunity, masking, movement through the host, some physical and chemical properties, serological reactions, pathogenicity, and control.

Bald (J. G.). **The structure of plastids and other cytoplasmic bodies in fixed preparations of epidermal strips.**—*Aust. J. sci. Res.*, Ser. B., 1, 4, pp. 452-457, 1 pl., 2 diags., 1948.

The fixation of the stromatic structure of plastids was achieved by using mixtures designed for fixing viruses in infected plant tissues [*R.A.M.*, 28, p. 438]. The structure of the cuboidal bodies was also demonstrated. Bodies formerly assumed to be protein crystals were fixed in a form that suggested a less simple structure and possibly a more important function than that of reserve protein. At times there seemed to be an association between plastids and bodies that was partly dependent on incident light.

Bald (J. G.). **The development of amoeboid inclusion bodies of Tobacco mosaic virus.**—*Aust. J. sci. Res.*, Ser. B., 1, 4, pp. 458–463, 2 pl., 3 diags., 1948.

In studies made at the Department of Plant Pathology, University of California, fixatives that preserved the stromatic structure of normal plastids [see preceding abstract] showed that 'amoeboid' inclusion bodies of tobacco mosaic virus also have a stromatic structure of a coarser and less regular type. Plastids were found with a distorted stroma and an accompanying staining reaction similar to that produced by virus inclusions. A series of stages was demonstrated from normal plastids to amoeboid inclusion bodies, which appeared to consist of one or more distorted and aggregated plastids. The possibilities of staining methods for the study of virus-host cell relations are discussed.

Köhler (E.) & Hauschild (Irmgard). **Betrachtungen und Versuche zum Problem der 'erworbenen Immunität' gegen Virusinfektionem bei Pflanzen.** [Observations and experiments on the problem of 'acquired immunity' against virus infections in plants.]—*Züchter*, 17–18, 4–5, pp. 97–105, 1 fig., 2 graphs, 1947.

This is a reasoned discussion, supported by experimental data, of the authors' contention that the phenomenon of 'acquired immunity', first described by Kunkel [*R.A.M.*, 13, p. 648] and later designated by Quanier premunity [ibid., 26, p. 134; 28, p. 321], is due to the depletion by the virus first infecting the host of certain definite radicles in the cells [ibid., 13, p. 462; cf. 18, p. 131] which are no less essential to the second infective principle. Deprived of the possibility of multiplication and subsequent invasion of the phloem, the latter is rendered incapable of causing actual infection.

The assumption of an active defence against the second virus [ibid., 25, p. 76] is contradicted by the results of experiments with two strains of potato virus X. When strain Cs 44 was inoculated into Samsun tobacco plants already invaded by Bm, the former persisted for four days alongside the latter and retained its activity. However, the multiplication of the super inoculated (unrelated) virus does not invariably proceed unopposed by the first occupant of the host, as shown by Bode's recent experiments with the 'EN' virus' [ibid., 28, p. 550]. When inoculated into leaves already permeated by the tobacco mosaic virus the necrotic lesions formed by 'EN' are much smaller and soon cease to expand.

An exception to the cross-immunity rule is closely analysed and the successful superinoculation of the tobacco mosaic on the para-tobacco mosaic virus [ibid., 28, p. 88] is interpreted as a result of the relatively low concentration reached by the latter in the host. This argument is reinforced by a test involving the inoculation of *Nicotiana glutinosa* with a series of comparable dilutions of the two viruses, which disclosed an identical aggregation gradient in both. It was further shown that there were no differences in the multiplication rates of the two viruses in the inoculated leaf during the first 12 days after infection.

All the foregoing expressions of antagonism between two viruses [ibid., 26, p. 378] are reconcilable with the idea that virus multiplication is limited by the minimum content in the plant cells of the particular radicles indispensable for this purpose ('minimum theory') in so far as no complications are introduced by inactivating factors in individual cases.

In conclusion an experiment is described in which one of the nearly related partners (a yellow strain of tobacco mosaic virus known as Mu) in a mixed infection completely predominated over and apparently expunged the other (para-tobacco mosaic virus). These observations would seem to call for a reconsideration of some conclusions recently advanced on the subject of mixed infections, e.g., those of Thung [see preceding page] and Gäumann [ibid., 25, p. 76].

Bertus (L. S.). **Plant pathology.**—*Adm. Rep. Dir. Agric., Ceylon, 1947*, pp. D10–D14, 1949.

In this report [cf. *R.A.M.*, 27, p. 555] it is stated that [loose] smut (*Ustilago avenae*) of oats [ibid., 21, p. 327] and sugar-cane smut (*U. scitaminea*) [ibid., 28, p. 161] were reported for the first time in Ceylon during 1947.

Continuing the eradication of plantain [banana] plants affected by bunchy top, from January to August 387 diseased plants were destroyed in Matale South, 11,073 in Matale East, in the Kegalla District in Paranakuru Korale 165,167, in Beligal Koral 225,318, and in Galboda and Kinigoda Korales 69,858. In the Kandy District in Harispattu, and in Yatinuwara, and Udunuwara the figures were 9,202, 15,849, and 4,852 respectively, and in the ranges of Negombo, Bandaragama and Veyangoda in the South-western Division, and Tissamaharama in the South-eastern Division 4,907, 3,227, 32,249, and 25,010 respectively.

Six-year-old *Hevea* rubber trees from budded stumps of clone TJ. 16 in the Galagedera district developed die-back, after having been severely attacked by *Oidium* [*heveae*: ibid., 28, p. 194] during the previous refoliation season. In some cases the die-back was limited to small shoots or to one or more lateral branches. In others it had spread down the main stem from the terminal shoot almost to the graft union, killing sometimes the cortex on one side of the tree. The condition was probably due to the weakening of the tree by *O. heveae* rendering it liable to infection by *Diplodia* [? *Botryodiplodia theobromae*] which was advancing through the weakened tissues. Six-week-old *Hevea* seedlings suffering from a stem disease later identified as being caused by *Pestalotia palmarum* [ibid., 9, p. 405] were received from the Agricultural Stations at Egal-oya and Walpita. At Walpita about 300 seedlings were killed out of 23,000. Removal of the dead seedlings and thorough spraying of the nursery plants with colloidal copper three times at weekly intervals should be sufficient to eradicate the pathogen.

Occasional wilting and death of some of the oldest trees at the Government *Cinchona* plantation at Massena was thought to be due to the physical character of the soil. Young or old plants with reduced leaves had a wet and decaying root cortex, and young plants with tapering main shoots also had dead and dying roots. At present the remedy appears to be deep drainage and cultivation.

Die-back of seven Valencia late orange trees in the Wagolla district was due to pink disease (*Corticium salmonicolor*), the disease originating at the forks where several branches arose together. Diseased branches should be cut off together with about 9 in. of healthy tissue, and the unaffected branches painted with a 10 per cent. solution of brunolinum plantarium [ibid., 26, p. 531], especially at the forks.

At a plant supply nursery at Pethiyagoda a number of six-week-old crowded jak (*Artocarpus integer*) seedlings were dying in August. The disease occurred in patches, and in the centre of each the plants were dead and leafless, those immediately surrounding them were dying, and the stems of apparently healthy plants outside these were enveloped to a height of about 1 in. by a thick, white mycelium. The fungus was identified in culture as *Sclerotium rolfsii*. All the plants in the affected patches and a ring of apparently healthy plants were destroyed, the surface soil was buried in holes 6 to 9 in. deep, and the remaining soil disinfected with a 10 per cent. solution of brunolinum plantarium.

Killick (A. B.). **Annual Report of the Department of Agriculture, Uganda Protectorate, for the period 1st April, 1946–31st March, 1947.—Part II. Experimental.**—89 pp., 7 graphs, 1 diag., 1949.

The following items occur in this report [cf. *R.A.M.*, 27, p. 223]. In the report on cotton, Kawanda area (pp. 6–30), H. L. Manning states that in work on resistance to blackarm (*Bacterium* [*Xanthomonas*] *malvacearum*) [ibid., 28, p. 454] it has been

found that in the climatic conditions which prevail locally during late July and early August the angular leaf spot phase appears to be inhibited. From June (when the breeding material was planted) until late August very cloudy conditions prevailed, and the rapid development of angular leaf spot demands sunny conditions in addition to a certain minimum rainfall. As grading for resistance is based on restriction of leaf spots, Knight has suggested that further work on gene transference at Kawanda should be suspended for the present. Under certain climatic conditions in Uganda crop losses due to *X. malvacearum* even from strains homozygous for B_2 appear to be quite considerable.

In an attempt to determine the mode of inheritance of resistance to *Verticillium* wilt [*V. dahliae*: ibid., 27, p. 473] in B 181, F_2 progenies were grown from 30 selected F_1 plants. On a basis of internal symptoms there was no evidence that resistance is inherited as a simple Mendelian character. The inoculation technique, however, does not appear to be entirely reliable.

On p. 31 it is stated that in the Serere area separate variety trials indicated that certain selections of the N 17 group, namely S 4101, S 4106, and S 4108, had fewer blackarm lesions per plant and gave higher yields of seed cotton than the N 17 standard. The B 181 group showed more than the N 17 derivatives.

Yields of Amani cassava varieties resistant to mosaic [ibid., 27, p. 63] ranged from 3·9 to 7·7 tons per acre in 1946, the best being Nos. 8 and 11. Planting material from these trials was issued to growers.

Conners (I. L.) & Savile (D. B. O.). **Twenty-eighth Annual Report of the Canadian Plant Disease Survey, 1948.**—xix+118 pp., 1949. [Mimeographed.]

In the section on new or noteworthy diseases [given also in French] in this report [cf. *R.A.M.*, 27, p. 553] it is stated that in Manitoba and eastern Saskatchewan only a trace of stem rust (*Puccinia graminis*) [ibid., 28, p. 562] developed on Thatcher, Regent, and Redman wheat in comparison with 80 per cent. or more on susceptible varieties. Three races of leaf [brown] rust (*Puccinia triticina*) [loc. cit.] caused most of the infection on Regent and Redman. Crown rust (*P. coronata*) infection was slight in Manitoba and southern Saskatchewan, but severe locally in Ontario and in the eastern provinces. A herbarium specimen of *Tilletia caries* [ibid., 28, pp. 443, 450], collected at Armstrong in 1931, has since been identified as dwarf bunt (? a race of *T. caries*). *Gibberella zeae* [ibid., 28, p. 170] was recorded for the second time in Manitoba, perithecia of the fungus being collected in August on maize stubble of the previous crop. Some promising new barley varieties in Manitoba suffered from attacks of speckled leaf blotch (*Septoria passerinii*) [ibid., 25, p. 156], a disease usually of minor importance.

Lucerne bacterial wilt (*Corynebacterium insidiosum*) [ibid., 28, p. 562] was reported for the first time in eastern Canada, affecting several fields in southern Ontario. Flax rust (*Melampsora lini*) [loc. cit.] was epidemic in southern Manitoba and south-eastern Saskatchewan, causing losses estimated at $9,000,000. The resistant Royal [loc. cit.] was severely damaged. *Alternaria linicola* [ibid., 26, p. 405] was found for the first time on field material, on which it was causing a brown stem canker.

Diseases of soy-bean were of little importance during the year under review. However, brown stem rot (*Cephalosporium gregatum*) [ibid., 28, p. 204] attacked several varieties in south-western Ontario, and under more favourable conditions it may become destructive.

In Quebec and Manitoba 60 per cent. of the seed potato fields entered for certification were rejected owing to bacterial ring rot (*Corynebacterium sepedonicum*) [ibid., 28, pp. 354, 443, 486]. The disease is equally serious in table stock [ibid., 28, p. 27]. Only 6 of 177 trucks received from Alberta were diseased. Efforts to keep the disease out of British Columbia and Prince Edward Island and to control it in

Alberta and Ontario were highly successful, but these measures are hindered by prevalence in other areas.

A single Late Duke cherry tree at Creston was found affected with reversion virus. The fruits ripen unequally, very small green ones being present with ripe ones. Owing to the wet weather, strawberry red core (*Phytophthora fragariae*) [ibid., 26, p. 440; 28, p. 444] was prevalent in Nova Scotia, where it appears to be well established. Leaf blight (*Dendrophoma obscurans*) [ibid., 27, p. 430] was reported for the first time in Canada from three localities in Ontario. In British Columbia downy mildew (*Peronospora rubi*) was found for the first time on wild species of *Rubus*.

Heavy attacks of rust (*Chrysomyxa ledicola*) [ibid., 18, p. 643] caused considerable defoliation of spruce (*Picea glauca*) throughout Manitoba. Cankers found on laburnum in Ontario were caused by *Fusarium lateritium* [*Gibberella lateritia*].

Report on agricultural research for the year ending June 30, 1948.—*Rep. Ia agric. Exp. Sta., 1947–48*, 390 pp., 10 figs., [? 1948].

In the botany and plant pathology section (pp. 173–195) of this report [cf. *R.A.M.*, 28, p. 115] C. S. Reddy and B. N. Wadley state that *Pythium irregulare* [loc. cit.], which attacks watermelon seeds and seedlings, may cause root necrosis, resulting in stunting or death of the seedlings. Stands in infested soil are reduced to about 5 per cent. Many isolates of *Fusarium bulbigenum* var. *niveum* [loc. cit.] and other *F.* spp. were obtained from seedlings which showed no disease symptoms; moreover these species do not seem to reduce emergence except in a heavily infested soil, and even then only moderately.

H. C. Murphy reports that during 1947 oat yields were reduced by 32 per cent. by *Helminthosporium victoriae* [ibid., 28, pp. 390, 521]. It was estimated that by 1948 95 per cent. of the acreage would be planted with the resistant Bond derivatives, many of which, however, are susceptible to race 45 of crown rust (*Puccinia coronata*) [loc. cit.], which was widespread during the period under review. The Bond derivatives, grown at 25 locations throughout the United States, showed appreciable crown rust infection at only three. The average reading for Victoria was 0·7 per cent. compared with 2·9 per cent. for Bond, and those for all Victoria derivatives and all Bond derivatives were 1 and 3 per cent. respectively.

W. J. Hooker and C. S. Reddy report that slip yields were greater when fleshy roots of sweet potato were dipped in dithane. Arasan used as a preplanting slip treatment gave the best control of stem rot (*Fusarium oxysporum* f. *batatas*) [*F. bulbigenum* var. *batatas*: ibid., 28, p. 117]. Control of the soil pox disease (*Streptomyces ipomoea*) [ibid., 28, p. 514] was most effective when sulphur was broadcast at the rate of 800 lb. per acre.

W. F. Buchholtz and C. S. Reddy estimated successfully the intensity of soil infestation by *Aphanomyces cochlioides* [ibid., 28, p. 611] in 24 sugar beet fields by growing seedlings in the greenhouse in soil samples collected in the spring from each field, and determining the rate of infection. It was found that the estimated intensities of soil infestation were correlated with (1) predicted crop losses by *A. cochlioides*, (2) weights of 300 beets harvested, and (3) percentage of deformed beets in the respective fields. Four presumably resistant lines grown in a heavily infested plot showed no striking resistance.

W. F. Buchholtz, C. S. Reddy, and W. J. Hooker report that of the fungicides tested on Cobbler potato plants, dithane D 14 plus zinc sulphate plus lime, and parzate provided the best foliage protection against early blight [*Alternaria solani*: ibid., 27, p. 581] and gave slightly higher yields, followed by phygon, tribasic copper, and Bordeaux mixture.

C. S. Reddy and N. R. Gerhold state that the pathogenicity of a species of *Pythium* to maize was highest at medium soil moisture content (50 to 60 per

cent.). In comparative fungicide tests phygon, dow 9B, and zinc mercury chromate were equal to or better than previously recommended maize seed treatments. Dusting was as effective as the slurry method. The application of sodium chlorate to soil (100 p.p.m.) aids in the evaluation of fungicidal dusts by retarding the germination of flax, which in turn leads to increased injury by *Pythium* sp. Seed treatments of six flax varieties with new improved ceresan at 1 oz. per bush. [ibid., 28, p. 117] resulted in yield increases of 151·5 per cent. on the average in one test. Ceresan M ($\frac{1}{2}$ oz. per bush.) gave the best control of *H. victoriae* on heavily infected Tama oats. Seed dressing was less effective than in 1946 owing to later development of the disease. Treatment is usually responsible for an increase of a little over 3 bush. per acre with all oat varieties, including the resistant ones. If hulled oats are to be used for seed they should not be treated more than a week in advance of sowing.

G. L. McNew and R. A. Young report that isolates of the oak wilt fungus (*Chalara quercina*) [ibid., 28, p. 552] from different species of oak in 15 different localities were similar in cultural characteristics, physiology, and virulence. On 1 per cent. dextrose in 2 per cent. agar medium germination was 95 to 100 per cent. White oaks with localized symptoms may be saved by removal of the diseased branches at a point 4 to 6 ft. farther back than the proximal symptoms. Plot maps suggest that spread may be by means of a colonial insect, mechanical contact, or rodents.

According to H. C. Murphy, C. S. Reddy, and I. J. Johnson, the most destructive barley diseases in 1947 were *Pythium* root necrosis (*P. debaryanum* and *P. graminicola*), *Helminthosporium* seedling blight and spot blotch (*H. sativum*), scab [ear blight, *Gibberella zeae*], loose smut [*Ustilago nuda*], and mildew [*Erysiphe graminis*], causing an estimated yield reduction of 16·6 per cent. Seedlings of 30 varieties were sprayed with mycelial suspensions of 30 isolates of *H. sativum*; of these, eight appeared to be strongly pathogenic and none of the varieties showed marked resistance to them. In another experiment heavy mycelial suspensions of the three most pathogenic isolates were poured on the soil to determine the reaction of 20 barley and two oat varieties. Greater differences in varietal reaction were obtained by this method. On the basis of root length, C.I. 7256, Moore, C.I. 7117, and Wisconsin 38, were the most resistant [barley varieties]; for average of emergence, top and root length, Moore, C.I. 7117, and C.I. 7252 were most outstanding. Clinton oats was more resistant than any of the barley varieties, while Tama was equal to the more resistant ones. Between the above 22 barley and oat varieties, when tested for resistance to two virulent isolates of *P. graminicola*, varietal differences were slight; Moore, Manchuria, and C.I. 7143 were the most resistant of the barley varieties, and of the oats Clinton was outstanding and Tama more resistant than the barley varieties. Moore has been named recently and increased for distribution in Wisconsin.

In his study on soy-bean diseases G. L. McNew states that Lincoln, Richland, Mukden, Habaro, and Manchukoto were equally susceptible when inoculated with the anthracnose organism *Colletotrichum* [*Glomerella glycines*: ibid., 24, p. 357; 27, p. 7]. Three isolates all produced conidia on sterile soy-bean stems, but not on other media; one also produced perithecia. Steamed stems inoculated with the *Diaporthe* canker fungus [*D. phaseolorum* var. *sojae*: ibid., 28, p. 107] developed beta spores in pycnidia after 8 to 25 days, while alpha spores developed at the same time or earlier. Under field conditions the homothallic strain was more pathogenic than the heterothallic unless the latter was paired. *Pythium* root and neck rot [*P. debaryanum* and (?) *P. graminicola*: ibid., 22, p. 463; 25, p. 431] occurred on 1·37 per cent. of the plants on the Agronomy Farm, and ranged from 0 to 22 per cent. on naturally infested soil in the greenhouse. Seed treatment with arasan (2 oz. per bush.) reduced infection in both greenhouse and field. A species of *Alternaria*

[ibid., 27, pp. 7, 459] was isolated from irregular to circular brown spots with grey centres occurring on pods and leaves; a spore suspension caused infections when applied to wounded tissues.

G. L. McNew, I. J. Johnson, and C. P. Wilsie report that bacterial leaf blight [*Pseudomonas coronafaciens* var. *atropurpurea*: ibid., 26, p. 493] of *Bromus inermis* was widespread and caused serious damage during the wet period in June. Inoculations with pure cultures were fairly successful when made while plants were water-soaked. Samples of ergot [*Claviceps purpurea*: ibid., 27, p. 558] obtained from *B. inermis*, *B. purgans*, *B. polyanthus*, *B. marginatus*, *B. japonicus*, and 42 other grasses proved to be identical in morphological characters. *B. inermis*, *Dactylis glomerata*, *Agropyron repens*, and *A. smithii* appear to be most susceptible.

Oregon's agricultural progress through research.—*Sta. Bull. Ore. agric. Exp. Sta.* 461, 138 pp., 52 figs., 2 maps, 1 graph, 1948.

This report contains the following items of phytopathological interest. Excellent control of blind seed disease [of *Lolium perenne*, caused by *Phialea temulenta*: *R.A.M.*, 24, p. 151] was obtained in Oregon in 1945 and 1946, but during 1947 the incidence of the disease increased seriously, endangering the 1948 crop. Preliminary analysis showed that this was due to (1) too many badly infected fields being left in production; (2) lack of control in pastures due particularly to the use of diseased seed; and (3) favourable weather conditions for the development of the pathogen. Breeding for resistance to the disease is in progress.

The results of tests in which potato fields were dusted with DDT in combination with sulphur and oil indicated that although the insecticide reduced the spread of virus diseases [unspecified], the use of disease-free 'seed' is still the most important controlling factor.

Resistance of hop varieties to downy mildew [*Pseudoperonospora humuli*: ibid., 28, pp. 142, 592] under exceptionally heavy disease conditions was studied in four areas during 1947. In two areas all hills, including Late Clusters and named varieties and seedlings, became infected naturally or following greenhouse inoculation, with the exception of a single plant of Belgian Fuggle. In another area 45·16 per cent. of Fuggle and 0·81 per cent. of Late Clusters remained uninfected, while in the fourth area 11·91 per cent. of the hills escaped infection (natural and artificial); of these 11·13 per cent. were seedlings and the remainder comprised one plant each of Belgian No. 31, Belgian Spalt, East Kent Golding, Landhopfen, Miller's Bavarian, Serebrianka, and Skorospelka.

Several related viruses were found to occur commonly on lilies. While in one species a virus may cause no symptoms, it can be destructive in another. 'Rubrum' (*Lilium speciosum*) and Croft lilies may be safely grown in the same planting, but Ace and Rubrums should not; Madonna and goldband lilies are especially dangerous to Rubrums.

Sixty-first Annual Report of Purdue University Agricultural Experiment Station, Lafayette, Indiana, for the year ending 30th June, 1948.—147 pp., 28 figs., 1 graph, 1948.

This report [cf. *R.A.M.*, 27, p. 355] contains the following items of phytopathological interest. A. J. Ullstrup (p. 6), subjecting 300 inbred lines of maize to an artificial epidemic of *Helminthosporium turcicum* [loc. cit.], found that C 103, K 24, and several early inbred generations from Ohio showed fairly high resistance. An early generation line from North Carolina, one from Missouri, and HK 59 displayed very high resistance. The evidence indicates that resistant lines can be developed.

G. B. Cummins, R. E. Lincoln, and R. W. Samson (pp. 19–20) selected from 2,100 field-grown tomato plants resistant to *Septoria* [*lycopersici*: ibid., 28, pp. 118,

255] 24 lines with desirable fruit and vine characters. Of 500 R_1 tomato plants segregating for resistance to *Alternaria* stem canker [*A. solani*: ibid., 28, p. 254] and to Fusarium wilt [*F. bulbigenum* var. *lycopersici*: ibid., 28, p. 256], ten large-fruited selections of desirable vine type were made. Promising new lines have been developed by repeated back-crossing of wilt-resistant hybrids to the commercial parents, by selection from the early back-cross progenies, and by intercrossing of wilt-resistant lines.

Laboratory experiments by G. A. Gries (p. 88) indicated that aluminium salts suppress the growth of *Actinomyces scabies* in acid and alkaline culture media and control the incidence of scab in muck soils.

In spraying tests on Gallia Beauty apple-trees J. R. Shay obtained the best control of scab [*Venturia inaequalis*: ibid., 27, p. 356] with 10 applications of copper 8-quinolinolate (1 lb. per 100 gals.) as determined by lesion counts on fruit and foliage in late June, and with only 3·1 per cent. affected fruits at harvest. The schedule in which copper 8-quinolinolate was substituted for liquid lime-sulphur in the pre-bloom sprays in the usual rota came second with 5·8 per cent. scabbed fruits. Fermate (1½ lb. per 100 gals.) was third with 5·9; the recommended Purdue schedule, compound 341–C (1 quart), phygon (½ lb.), and sulphur paste (8 lb.) gave 7 to 8·9; goodrite p.e.p.s. [ibid., 28, p. 407] (1 gal.) 25·3; puratized (1 pint) substituted for lime-sulphur in pre-bloom sprays of the Purdue schedule 14·8, wettable sulphur (6 lb.) 18·5, and puratized 20·2 per cent. The unsprayed had nearly 100 per cent. scabbed fruit one month after bloom. The addition of goodrite p.e.p.s. in pre-calyx (½ gal. per 100 gals.) and calyx and cover sprays (¼ gal.) to fermate, phygon, copper 8-quinolinolate, and puratized appeared to improve the performance of all materials except puratized. The performance of these newer fungicides under the severe disease conditions of the tests indicates that if applied at frequent intervals from bud-break through third cover they may be expected to give at least as good control as lime-sulphur.

J. R. Shay and L. F. Hough state that in further investigations of apple scab resistance [ibid., 28, p. 337] 23 resistant clones were evaluated in greenhouse inoculation studies. Two developed no symptoms, 13 only pin-point depressions, four irregular necrotic or chlorotic non-sporulating lesions, and four supported sparse sporulation in sharply delimited lesions.

C. L. Burkholder and O. W. Ford report that improved methods of applying liquid lime-sulphur so as to avoid foliage injury to fruit trees have proved successful. By avoiding the drenching types of application and discontinuing the use of liquid lime-sulphur under slow drying conditions the usefulness of this cheap, effective fungicide has been much improved both against apple scab and peach brown rot [*Sclerotinia fructicola*: ibid., 27, p. 139].

E. G. Sharvelle and G. O. Mott report that preliminary experiments begun in 1947 to study the effect of organic fungicides on turf in the absence of disease showed that four applications of some fungicides to bent grass [*Agrostis* sp.] at weekly intervals stimulated the crab grass [*Digitaria* sp.: see next abstract] population. Autumn records confirmed these findings and indicated that fungicides of the calomel type significantly increased the crab grass populations and were more injurious to old orchard bent grass than some of the newer organic fungicides.

Fifty-ninth Annual Report of the Rhode Island Agricultural Experiment Station.—56 pp., 12 figs., 1947. [Received August, 1949.]

In this report [cf. *R.A.M.*, 24, p. 443 and next abstract] it is stated that during 1946, phygon (½ lb. per 100 gals.) gave the best results against apple scab [*Venturia inaequalis*]. Puratized agricultural spray (1 pint per 100 gals.) gave perfect control only if allowed to dry on the leaves before rain and was effective when less than 24 hours elapsed between inoculation and spraying. Three applications to healthy

leaves at 24 [-hour] intervals at high humidity caused only a trace of injury, but treatment of badly scabbed leaves at low humidity caused much damage. Water-soluble phenyl mercury acetate was effective and not phytotoxic at 1 in 18,000.

Potato tuber initials showed a predisposition to rot (due to *Erwinia carotovora*, *E. aroidea*, *Bacillus mesentericus*, and *B. polymyxa*) [ibid., 28, p. 306] when spring rains saturated the soil for 48 to 72 hours. Soil temperature and fertility also influenced incidence and severity of lenticel infection. Young tubers rotted in wet soil at 40° F., but more rapidly at 65° to 75°. The least amount of decay in tuber initials was found in wet soils fertilized with phosphates and potassium only, or to which no fertilizer had been applied, the greatest amount being with heavy dressings of high-nitrogen fertilizers.

In field trials against potato blight (*Phytophthora infestans*) [ibid., 27, p. 254; 28, p. 483], in which Green Mountain potatoes were given nine applications of various fungicides, starting 20th June and ending 26th August, 1946, at the rate of 150 gals. per acre, all the plots except one being sprayed with DDT, the yields obtained were: no DDT, no fungicide 203 bush. per acre; DDT, no fungicide 195 bush.; Bordeaux (8–4–100) 404 bush.; tribasic copper (4 lb. per 100 gals.) 329 bush.; phygon (½ lb. per 100 gals.) 278 bush.; zerlate (2 lb.) 282 bush.; isothan Q 15 powder, (1 lb.) 190 bush.; isothan Q 15 liquid, (1 pint) 217 bush.; P–177 (*p*-aminophenyl cadmium dilactate; 1 lb.) 169 bush.; P.M.A.S. (phenol mercury acetate, ½ pint) 196 bush.; and G–11 (2 lbs.) 260 bush. Blight was unusually severe. Bordeaux mixture and tribasic copper prevented a noticeable increase in the amount of blight after the application, and the plants sprayed with these materials were still partly green at digging.

A 20 per cent. active, wettable P–177 powder was formulated for broadcasting dry or suspended in 100 gals. water and sprayed on to 10,000 sq. ft. of lawn. This fungicide reduced disease injury to zero, as compared with averages of 43 and 60 per cent. killed in two series of control plots. It controlled all four major turf diseases [*Sclerotinia homoeocarpa*, *Corticium solani*, *Gloeocercospora sorghi*, and *Calonectria nivalis*: cf. ibid., 24, p. 105; 29, p. 30]. A single application allowed turf with 69 per cent. of the surface area killed to show 90 per cent. recovery in two weeks and when a second application was made, ten days after the first, the plots were completely disease-free in three weeks. P.M.A.S. besides being the second best turf disease control agent was also a specific crab grass (*Digitaria*) inhibitor [see preceding abstract]. Dilutions of 1 in 18,000 were effective when applied at the rate of 10 gals. per 1,000 sq. ft. Puraturf was the third best fungicide and second best crab grass deterrent.

Sixty-first Annual Report of the Rhode Island Agricultural Experiment Station.—38 pp., 6 figs., 2 graphs, 1949.

In this report [cf. preceding abstract] laboratory studies on Dutch elm disease [*Ceratostomella ulmi*: *R.A.M.*, 28, p. 258] in Rhode Island are described. They showed that healthy young seedling elms one to two years old do not easily succumb to invasion by the fungus, but if kept in the dark for five days they readily develop injurious effects after inoculation. Also there is a correlation between the sugar content of some plants and their likelihood of injury by certain fungi. These testing methods are greatly speeding up the evaluation of chemotherapeutic treatments. If the medium is maintained at or over pH 7 the fungus does not readily produce the toxins which injure the living cells; furthermore, the toxin was rendered innocuous in solutions containing free hydroxyl ions. The predisposition of elms to more severe injury when growing in acid soils was confirmed in the greenhouse and in experimental areas of the Bartlett Tree Research Laboratories, Stamford, Connecticut. The results obtained indicated that treating the soil round the roots with certain basic chemicals retards toxin production by *C. ulmi*, damage

to the tree then being slight or nil. Chemotherapeutants are being developed to help trees to resist the disease or to inactivate the toxin produced by the fungus.

An organic mercury-copper complex, P111–5, appears to cause complete arrest of potato blight (*Phytophthora*) [*infestans*] on the foliage. Conventional heavy equipment for the application of fungicides in 100 to 200 gals. water per acre may be modified by a light-weight mist-blower attachment for any standard tractor. This apparatus will apply 5 to 10 gals. spray per acre of potatoes or other row crop. The conditions for obtaining adequate coverage and avoiding injury are being worked out in the laboratory and field by micronizing the droplets of fungicide concentrate. Oil-soluble fungicides are being so formulated that the solvent action of the oil on the natural waxy surface of leaves incorporates the fungicides as a relatively permanent protective barrier. A copper naphthenate, procop 110, dissolved in a 'safe' petroleum oil and then emulsified in water, was applied by air blast without injury to potato foliage; the deposit of fungicide-in-oil which remained showed excellent weathering properties and controlled *P. infestans*, though less than ½ lb. copper was applied per acre in each of six treatments.

Epiphytotics of turf diseases can be developed by covering the wetted, inoculated turf for 48 hours with a continuous layer of moist burlap. It is sprinkled just frequently enough to maintain visible moisture on the covered grass. Infectious material of the fungi causing dollar spot (*Sclerotinia homeocarpa*) [see preceding abstract] and brown patch (*Pellicularia filamentosa*) [*Corticium solani*: loc. cit.] grows well on a sterilized medium consisting of one part poultry mash, two of quartz sand, and one of water. Treating the sod area with fungicides whose comparative efficiency is to be tested, broadcasting the inoculum over the area, and then placing the wet burlap cover in position results in a clear differentiation of the merits of the fungicides tested. Organic cadmium compounds [loc. cit.] continued to give outstanding control of dollar spot even under the rigorous conditions of artificial inoculation, though some cadmium formulations were much better than others. That effectiveness does not depend upon water-solubility was indicated by the fact that the completely soluble cadmium-mercury complex, puratized GG, and the insoluble Merck cadmium both gave excellent control. A new product, Mallinckrodt cadminate, and the commercially available puraturf 177 also gave superior results.

The three improved selections of Piper velvet bent grass [*Agrostis canina*], A–3, B–11, and C–1, have continued to resist dollar spot. A heavy infestation of copper spot [*Gloeocercospora sorghi*: loc. cit.], producing 38 per cent. injury on some strains, caused only 1 per cent. injury to B–11 planted from stolons and 7 per cent. to the same planted from seed; C–1 showed only 3 per cent. damage, as against 8 to 12 per cent. on plots of the original Piper strain, and selection A–14 1 per cent. Some B–11 seed showed infection probably due to *Tilletia pallida* [ibid., 17, p. 825].

In the search for a muskmelon resistant to downy mildew [*Pseudoperonospora cubensis*: ibid., 24, p. 216] several crosses were made between Cuban Castilian, Texas Resistant No. 1, and the best commercial varieties. One hybrid, Iroquois × Texas Resistant No. 1, is outstanding, the fruits being of excellent quality, and two others very superior to commercial varieties.

Annual Report of the Agricultural Experiment Stations, Florida, for the year ending June 30, 1948.—280 pp., 22 figs., 7 graphs, [? 1949].

The following items are selected from various sections of this report [cf. *R.A.M.*, 28, p. 326]. W. B. Tisdale and A. A. Foster state that in greenhouse tests using soil inoculated with *Rhizoctonia* and antagonistic isolates of *Trichoderma* [loc. cit.] inoculations with all isolates of *Rhizoctonia* except one, from a pine seedling, reduced emergence of bean, cabbage, celery, and lettuce seedlings, the one from bean causing greatest reduction. In replicated field plots the stems of snap beans

[*Phaseolus vulgaris*] and Fordhook Lima beans [*P. lunatus*], eight weeks after planting in soil to which green vegetation had been added, showed about twice as many deep *Rhizoctonia* lesions as plants in soil without admixture.

In further breeding work with eggplants for resistance to fruit rot and blight (*Phomopsis*) [*vexans*] P. DECKER found that several hybrid lines remained free from disease while all the commercial varieties tested failed completely.

E. WEST reports that 60 specimens of *Camellia* diseases were received during the year. Over one-third of the specimens were affected by scab (*Sphaceloma* sp.). Die-back, on *C. japonica* and *C. sasanqua*, was next in importance. Isolations from dead stems, shoots, and flower buds yielded *Gloeosporium* sp. and *Phomopsis* sp. (in a ratio of 7 : 1 in the stems and shoots) in over 90 per cent. of the trials. Evidence was obtained that frozen flowers left on a plant offer a means of entry for these fungi.

P. DECKER and R. C. BOND state that *Glomerella cingulata* [ibid., 28, p. 18] again caused serious losses in the 1948 blue lupin seed crop. During the year brown spot (*Ceratophorum setosum*) [ibid., 29, p. 29] became widespread on lupins in areas of the south east, except in the Gainesville area of Florida. Powdery mildew (*Erysiphe*) [*E.* (?) *polygoni*] again caused defoliation late in the spring and reduced the seed crop in the Gainesville area.

In experiments conducted by A. H. EDDINS foliage of potato plants sprayed with dithane D14–zinc sulphate–lime (2 qts.–1 lb.–½ lb.–100 gals. water) plus 1 qt. 25 per cent. DDT emulsion in 100 gals. water suffered only 2 per cent. killing by blight [*Phytophthora infestans*], compared with 5 per cent. on the plots dusted with 4 per cent. dithane Z78 or with copper compound A (9 per cent. metallic copper) and 76 per cent. on the untreated plants. In fungicide tests conducted in Dade County by G. D. RUEHLE, using certified Bliss Triumph potato 'seed', dithane D14–zinc sulphate (2 qts.–1 lb.–100 gals.) gave the best control of *P. infestans* (13 per cent. foliage killed and 269 bush. per acre yield), closely followed by parzate (26 per cent. and 249 bush.) compared with 100 per cent. and 93 bush. for the unsprayed.

The best control of *Alternaria oleracea* [*A. brassicicola*: ibid., 28, p. 510] in cabbage seedlings sprayed with a spore suspension was obtained with karbam white (6 per cent. infected), parzate (8 per cent.), fermate (10 per cent.), all at 2 lb. in 100 gals. water, and spergon (14 per cent.) at 4 lb. in 100 gals. The worst epidemic of cabbage black rot (*Bacterium campestre*) [*Xanthomonas campestris*: ibid., 28, p. 273] ever recorded for northern Florida occurred during the season. The only fields free from rot were those set with plants grown from healthy seed in non-infested soil.

J. M. WALTER, J. R. BECKENBACH, and D. G. A. KELBERT report that the F_5 generation of some tomato lines selected from crosses made in 1946, are breeding true for combined resistance to wilt [*Fusarium bulbigenum* var. *lycopersici*], collar rot [*A. solani*], and *Stemphylium* leaf spot [*S. solani*]. The F_4 of selected lines from crosses made also in 1946 for resistance to wilt and mosaic [(?) tobacco mosaic virus] has produced six lines resistant to both diseases. Three of these lines are also breeding true for resistance to *S. solani*. Leaf mould (*Cladosporium fulvum*) [ibid., 28, p. 380] was severe on the 1947 late crop. Only one F_3 line selected from a cross between W41–2 and LmW–3 (carrying the Vetomold type of resistance) remained absolutely free from the disease. A line with resistance to *Fusarium*, *Stemphylium*, and *Alternaria* and very promising in yield tests is to be released shortly for limited commercial trial. During the autumn of 1947, owing to the unusually wet weather, *S. solani* developed to epidemic proportions by December. The disease rating for plots treated with dithane D14–zinc sulphate–lime was 15 to 20 per cent., for parzate 50 to 60 per cent., copper A (4 lb. to 100 gals.) 45 to 85 per cent., and untreated 100 per cent. The plants sprayed with dithane also gave outstanding yields. Dithane also gave outstanding control of carrot leaf blight

caused by *Alternaria* [(?) *dauci*: ibid., 26, p. 441] and *Cercospora* [*carotae*: ibid., 28, p. 108] and gave a yield equivalent to 383 bush. per acre.

E. L. Spencer reports a severe outbreak of blossom-end rot [ibid., 27, p. 587; 28, p. 363] on Rutgers tomatoes in a series of nitrogen fertilizer plots on rain-soaked Leon fine sandy loam. Many of the roots were killed by the high water table and the remaining ones were unable to absorb sufficient water to meet the needs of the plants.

According to J. R. Beckenbach and E. L. Spencer copper deficiency, characterized by severe stunting and veinal necrosis, occurred in several vegetable crops, but was remedied by applying a copper fungicide spray. Several celery fields in the Sarasota muck area were abandoned entirely owing to black heart [ibid., 20, p. 192]. Preliminary soil analyses revealed that the nitrate nitrogen level in affected fields was roughly ten times that in normal ones and the total soluble salt levels were also consistently higher. R. O. Magie tested over 60 fungicides and combinations for the first time for the control of corm rot in Picardy *Gladiolus* (*Fusarium*) [*oxysporum* var. *gladioli*: ibid., 28, p. 399]. The following combinations of fungicides are recommended for trial as three-minute corm dips for Picardy: $\frac{1}{2}$ per cent. dow 9B+$\frac{1}{10}$ per cent. dowicide B; $\frac{1}{2}$ per cent. dow 9B+$\frac{1}{2}$ per cent. parzate; $\frac{1}{8}$ per cent. ceresan M+$\frac{3}{4}$ per cent. tersan. The standard new improved ceresan dip is recommended for treating the corms immediately before planting. *Botrytis* wet storage rot [*B.* (?) *gladiolorum*: ibid., 28, p. 398] was controlled in the Maid of Orleans variety by soaking the corms for five minutes before planting in a 2 per cent. suspension of tersan, $\frac{1}{8}$ per cent. phenyl mercury oleate, $\frac{1}{8}$ per cent. ceresan M+$\frac{1}{2}$ per cent. tersan, or $\frac{1}{2}$ per cent. dow 9B, or a ten-second dip in $\frac{1}{4}$ per cent. ceresan M.

B. F. Whitner states that the chlorotic spotting which has been present in *Gladiolus* plantings for some time is apparently due to an iron deficiency. It was corrected by spraying the plants at weekly intervals with 1 to $2\frac{1}{2}$ parts ferrous sulphate or ferrous ammonium sulphate in 1,000 parts water, acidified to a pH of approximately 5·6, plus a spreading and sticking agent.

Experimental results obtained by G. K. Parris indicate the existence of a second physiologic race of the watermelon anthracnose fungus (*Colletotrichum lagenarium*), which was recognized in Leesburg for the first time in 1947. An isolate from Ames, Iowa, closely resembles the original Leesburg isolate, while one from Charleston, South Carolina, resembles the new local strain.

At the Central Florida Station further experiments were made by A. A. Foster and J. W. Wilson using common commercial fungicides in controlling *Cercospora* blight of celery [*C. apii*: ibid., 26, p. 347]. Comparisons of several carbamates over the past three years showed the dimethyl carbamates (fermate, karbam, and zerlate) to be more effective than dithane or parzate in controlling blight. Copper fungicides gave control equal to the dimethyl series. D. L. Stoddard reports that at Everglades alternating schedules of dithane D–14 and the copper compounds gave best control of *C. apii*.

In investigations at the Citrus Station R. F. Suit, C. R. Stearns, and J. K. Colehour found that copper fungicides controlled citrus melanose [*Diaporthe citri*: ibid., 26, pp. 147, 542] more effectively than organic fungicides and that a neutral copper should be used at a copper content equivalent to that in a 3–3–100 Bordeaux mixture to obtain satisfactory control. According to R. F. Suit, L. C. Knorr, and R. W. Jones, spreading decline [ibid., 26, p. 147] appears to be caused by the citrus nematode (*Tylenchulus semipenetrans*).

D. L. Stoddard reports that although *Sclerotinia sclerotiorum* has caused severe losses in other parts of the State, it has not been a factor in the production of vegetables in the Everglades until 1948. In February about 50 per cent. of 500 acres of lettuce near Moore Haven were destroyed by the disease.

De Carvalho (T.). **Relação preliminar de doenças encontradas em plantes e insectos com anatações fitopatológicas.** [Preliminary report on the diseases observed in plants and insects with phytopathological annotations.]—84 pp., 9 pl., 25 figs., Colónia de Moçambique, Repartição de Agricultura, Secção de Micologia, 1948.

Among plant pathogens of economic importance in Mozambique, besides those already reported from another source [*R.A.M.*, 19, p. 330], may be mentioned *Macrosporium parasiticum* [*Pleospora herbarum*] on onion; *Cercospora beticola* [I.M.I. map No. 96] on beet; *Alternaria brassicae*, *Peronospora parasitica*, and *Xanthomonas campestris* [I.M.I. map No. 136] on cabbage; *C. cruciferarum* on radishes; *Leveillula* [*Oidiopsis*] *taurica* on chilli and *Tropaeolum majus*; cucumber mosaic virus, *Pseudoperonospora cubensis*, and *Erysiphe cichoracearum* on cucumber and other cucurbits; *Isariopsis griseola*, *X. phaseoli*, *Uromyces appendiculatus*, and bean mosaic virus on beans (*Phaseolus vulgaris*); *U. fabae* on broad beans; *U. striatus* on lucerne; *E. polygoni* on pea and sweet pea; *Actinomyces scabies*, *Alternaria solani*, *Corticium vagum* [*C. solani*], *Fusarium oxysporum*, *X. solanacearum*, potato virus X, potato streak virus [potato virus Y], Up-to-Date streak virus [strain of potato virus X], potato aucuba mosaic virus, and potato leaf roll virus on potato; cassava mosaic virus on cassava [I.M.I. map No. 184]; *A. solani*, *Cladosporium fulvum* [I.M.I. map No. 77], blossom-end rot, *F.* [*bulbigenum* var.] *lycopersici*, tomato bunchy top virus, tomato [tobacco] mosaic virus, and *Septoria lycopersici* [I.M.I. map No. 108] on tomato; *X. solanacearum* on egg plant; *A. longipes* [I.M.I. map No. 63], *Cercospora nicotianae* [I.M.I. map No. 172], *E. cichoracearum*, tobacco mosaic virus, and *Phytomonas* [*Pseudomonas*] *tabacum* on tobacco; *Curvularia lunata* and *Ustilaginoidea virens* on rice; *Gloeosporium papayae* and *Ovulariopsis papayae* on papaw; *Glomerella cingulata*, *Phoma* [*Guignardia*] *citricarpa* [I.M.I. map No. 53], *Diplodia natalensis*, *X. citri* [I.M.I. map No. 11], *Elsinoe fawcetti*, *Penicillium digitatum*, *P. italicum*, *Diaporthe citri* [I.M.I. map No. 126], oleocellosis, mottle leaf (zinc deficiency) [ibid., 25, p. 559; 28, p. 271], and concentric ring blotch [loc. cit.] on citrus; *Pestalotia palmarum* on coconut; *P. psidii* on guava; *Erwinia mangiferae* on mango; *G. cingulata* on mango, passion fruit, and *Annona squamosa*; *Gloeosporium musarum*, *Mycosphaerella musicola* [I.M.I. map No. 7], and *Stachylidium theobromae* [I.M.I. map No. 146] on banana; *Kuehneola* [*Cerotelium*] *fici* on fig; *M. fragariae* [I.M.I. map No. 110] on strawberry; *Physalospora perseae* on avocado; *Cercospora vitis*, *G. ampelophagum* [*Elsinoe ampelina*], and *Uncinula necator* on vine; *Tranzschelia punctata* [*Puccinia pruni-spinosae*] on plum and peach; *Fabraea maculata* on quince; *Armillaria mellea* [I.M.I. map No. 143] on tea; *P. kuehnii*, *Ustilago sacchari*, and maize streak virus on sugar-cane; *P. maydis*, *U. zeae* [*U. maydis*], and maize streak virus on maize; *P. purpurea* and *Sphacelotheca sorghi* on sorghum; *P. graminis*, *P. triticina*, and maize streak virus on wheat; *Ramularia areola* and *M. gossypina* on cotton; *Diplodia pinea* on *Pinus pinaster*; *Phomopsis juniperovora* on *Cryptomeria japonica*; *Puccinia antirrhini* on *Antirrhinum* spp.; *Septoria chrysanthemella* on *Chrysanthemum*; *S. dianthi*, *Uromyces caryophyllinus* [*U. dianthi*], and yellows virus on carnation; *P. helianthi* on sunflower; *P. pelargonii-zonalis* on *Pelargonium* spp.; *Diplocarpon rosae*, *Phragmidium disciflorum* [*P. mucronatum*], *Phytomonas* [*Bacterium*] *tumefaciens* [I.M.I. map No. 57], *Sphaceloma rosarum*, and *Sphaerotheca pannosa* on rose; and *Septoria violae* and *G. violae* on cultivated violets.

Three entomogenous fungi are listed, namely, *Nectria coccophila* [ibid., 23, p. 410] on *Chrysomphalus ficus* and *Empusa grylli* and *Beauveria bassiana* on locusts [cf. ibid., 25, p. 113; 27, p. 100, *et passim*].

Wood (E. J. F.). **Classification of bacteria.**—*Nature, Lond.*, 164, 4177, pp. 867–869, 1949.

The author states that there is a growing feeling of dissatisfaction among

bacteriologists with Bergey's 'Manual' [*R.A.M.*, 28, p. 512] and its system of classification of the bacteria and suggests that too many species have been erected and there has not been adequate study of variation within or between species and genera. The number of species should be reduced and defined in terms of possible range of variation. The solution, it is thought, lies in an alteration of the genus—species concept, which should be a convenient grouping rather than an attempted phylogenetic arrangement. Apart from morphology and pigmentation, although certain strains do vary in the latter, no single character is sufficient to delimit a species.

Leukel (R. W.). **Results from cooperative tests of cereal seed treatments.**—*Plant Dis. Reptr*, 33, 7, pp. 295–299, 1949. [Mimeographed.]

The results of co-operative tests, conducted in seven southern States of the United States during 1948–9 to determine the effectiveness of various fungicides in controlling several seed-borne diseases of autumn-sown cereals, indicated that in germination tests spergon, phygon XL, arasan, arasan S.F., and ceresan M slurry significantly increased emergence in Purplestraw wheat, artificially inoculated with *Tilletia foetida*, while seedox significantly reduced it in wheat and in barley naturally infected with stripe disease (*Helminthosporium gramineum*). In field trials covered smut (*Ustilago hordei*) and stripe disease in barley, loose and covered smut (*U. avenae* and *U. kolleri*) in Victorgrain oats, and *T. foetida* in wheat were completely eliminated by new improved ceresan, ceresan M, ceresan M slurry (all at ½ oz. per bush.) and 2·1 per cent. panogen (2 oz.), whereas the non-mercurials failed to control the diseases, with the exception of bunt, in which case they showed considerable merit [see below, p. 95].

Pu (M.-H.) & Yao (O.-Y.). **Reactions of Wheat varieties to stripe rust, leaf rust, and stem rust in Peiping, China.**—*Phytopathology*, 39, 6, pp. 513–515, 1949.

At the Peiping Agricultural Experiment Station in 1947–8, 787 indigenous wheat varieties from 22 provinces of China and 656 from foreign countries were tested (many in the greenhouse and all in field nurseries) for their reactions to stripe [yellow] rust, leaf [brown] rust, and stem rust (*Puccinia glumarum*, *P. rubigo-vera tritici* [*P. triticina*], and *P. graminis*) [*R.A.M.*, 25, p. 208]. Inoculum was collected near Peiping, where physiologic race 123 of *P. triticina* [ibid., 27, p. 128] and 17 of *P. graminis* [ibid., 28, p. 12] predominate, according to unpublished data of H. R. Wang. Severe epiphytotics of the three rusts were induced in the nurseries by inoculating susceptible border rows, and the fields were repeatedly irrigated to facilitate the spread of infection.

Most of the native wheats proved to be susceptible to all three rusts. Of the 651 winter and spring varieties procured from farmers, only four were resistant to *P. glumarum*, five to *P. triticina*, and three to both species. None was resistant to *P. graminis*. Of the 136 improved Chinese varieties, 13 were resistant to *P. glumarum*, 14 to *P. triticina*, and one to *P. graminis*. Four of the improved varieties, though susceptible in the seedling stage to black rust, were resistant to all three species in the field. They were hybrid Nos. 889, 918, 920, and 923 from a cross between a Chinese wheat and Percival's *Triticum albidum*. Chinese 166, which has been found resistant to many European races of *P. glumarum* [ibid., 24, 359), was susceptible at Peiping.

Many foreign winter wheats proved highly resistant to the three rusts. They included Cheyenne (C.I. 8885), Oro (C.I. 8220), Ioturk (C.I. 11388), Kanred (C.I. 5146), Poole or California Red (C.I. 3488), Turkey (C.I. 1558), Comanche (C.I. 11673), and Tenmarq (C.I. 6936), from the United States; Knoppies from South Africa, Buisson from France, Almond from Sweden, Weizen Montcalm 245 from Switzerland, and Agr. No. 8 from Japan. Among the resistant spring wheats were Thatcher (C.I. 10003), Pilot (C.I. 11945), Merit (C.I. 12036), Marquillo (C.I. 6887),

Marvel (C.I. 8876), Newthatch (C.I. 12328), Federation (C.I. 4734), and Regent (C.I. 11869). Hope (C.I. 8178), which has long been highly resistant to or virtually immune from many common North American races of *P. graminis*, was susceptible to this species in the seedling and moderately so in the adult stage at Peiping, but it proved to be quasi-immune from *P. glumarum* and highly resistant to *P. triticina*. *T. monococcum*, *T. timopheevi* [ibid., 28, p. 166], two varieties of *T. durum* (Acme, C.I. 5284, and Golden Ball, C.I. 6227), and one variety of *T. dicoccum* (Vernal, C.I. 3686) were highly resistant to or immune from the three rusts. Many varieties of *T. durum*, *T. dicoccum*, *T. spelta*, *T. persicum*, *T. pyramidale*, *T. compactum*, and *T. macha* were resistant to yellow and brown rusts but susceptible to stem, while *T. sphaerococcum* and *T. orientale* were resistant only to *P. glumarum*.

A breeding programme based on the hybridization of Chinese and foreign wheats offers the best prospect of securing rust-resistant varieties.

Johnston (C. O.), Caldwell (R. M.), & Compton (L. E.). **Leaf rust of Wheat in the uniform rust nurseries in the United States 1938–43.**—*Tech. Bull. U.S. Dep. Agric.* 960, 13 pp., 1 fig., 1948. [Received November, 1949.]

This bulletin contains a summary of the published information on varietal reactions of wheat to leaf [brown] rust (*Puccinia rubigo-vera tritici*) [*Puccinia triticina*: *R.A.M.*, 27, p. 120] in nurseries in the United States each year from 1938 to 1943, most of which has been noticed in this *Review*. Blackhawk winter wheat was highly resistant in tests made in 1943 only. Some unnamed hybrid lines, resistant to brown rust and other diseases and insects should be valuable parental stock. In spring wheat rust nurseries all durum and emmer varieties were resistant each year grown, and *Triticum timopheevi* [ibid., 28, p. 449] showed the highest resistance.

Of 48 physiologic races isolated from collections of brown rust in the nurseries, race 9 was commonest [ibid., 25, p. 298], followed by races 15, 76, 126, 44, and 5. Races 5, 15, and 76 were important east of the Mississippi and races 9, 44, and 126 west of the river. Race 126 has been increasing rapidly, especially in both the hard red winter and spring wheat areas.

Petit (A.). **La désinfection des semences de Blé contre la carie.** [The disinfection of wheat seed against bunt.]—*Bull. Serv. Bot. Agron. Tunis* 12, 7 pp., 1948. [Received November, 1949.]

In this bulletin, a revision of *Bulletin* 1 dated 15th November, 1945, the author describes the method of transmission of wheat bunt [*Tilletia caries* and *T. foetida*] in Tunis [cf. *R.A.M.*, 19, p. 333] and seed protection by means of fungicidal dusts [ibid., 27, p. 359] and copper sulphate [ibid., 26, p. 294].

Forlani (R.), Ciferri (R.), & Baldacci (E.). **Suscettibilità alla 'carie' (Tilletia spp.) di Triticum spp., con speciale riguardo alle razze italiane. Anni 1947–48 e 1948–49.** [Susceptibility to bunt (*Tilletia* spp.) of *Triticum* spp., with special reference to Italian races. Years 1947–48 and 1948–49.]—*Notiz. Malatt. Piante*, [*1949*], 3, pp. 1–7, 1949. [Mimeographed.]

The results are tabulated of tests carried out in Italy in 1947–8 and 1948–9 in which seed of wheats was grown in the field after being inoculated with mixtures of *Tilletia tritici* [*T. caries*: *R.A.M.*, 27, p. 415, and next abstract] and *T. levis* [*T. foetida*].

The results indicated that all the late *vulgare* wheats tested were in general more susceptible than the early ones. The only race of *Triticum spelta* (Russa) tested was not susceptible.

Among the tetraploid wheats, *T. durum* (Cappelli), two races of *T. dicoccum* (aristato and mutico), and *T. polonicum* (Russa) were immune, as were two races

of *T. monococcum* (an old Italian line and Esotica). *Haynaldia villosa* showed very slight infection in 1947–8 only. *T. sphaerococcum* showed much less infection when sown late.

Ciferri (R.), Forlani (R.), & Baldacci (E.). **Efficacia preventiva dell' 'agrosan G.N.' contro la 'carie' del Frumento in rapporto all' epoca di semina.** [The preventive efficacy of 'agrosan G.N.' against Wheat 'bunt' in relation to date of sowing.]—*Notiz. Malatt. Piante*, [*1949*], 3, pp. 7–8, 1949. [Mimeographed.]

When the wheat varieties Mentana, S. Giorgio, S. Pastore, Motten Est, Gentil Rosso 48, Inallettabile 210, and Rieti 11 were sown on 16th October, 1948 after seed treatment with agrosan G.N. [*R.A.M.*, 26, pp. 318, 336] and Caffaro powder [copper oxychloride: ibid., 1, p. 26; 27, p. 484] against bunt [*Tilletia caries* and *T. foetida*: see preceding abstract] only S. Pastore in the agrosan series developed diseased ears (2 per cent.) and in the Caffaro 9, 0·3, 1, 3, 5, 17, and 1 per cent., respectively, developed. When the same varieties were sown on 10th November, 1948 after the same treatments no infection appeared in the agrosan series; for Caffaro powder the figures were 0, 0, 0, 17, 0, 7, and 2 per cent., respectively.

Gimesi (N.) & Frenyó (V.). **Min alapszik a humusz seskentő hatása a kőüszögspórák kihajtására?** [What is the basis of the stimulative effect of soil on the germination of *Tilletia* spores?]—*Agrártudomány* (*Agricultural Science*), 1, 5, pp. 252–254, 1949. [Russian and English summaries.]

The stimulating effect of soil on the germination of wheat bunt (*Tilletia* [*T. caries* and *T. foetida*]) spores in Hungary [*R.A.M.*, 6, p. 350, *et passim*] is attributed to absorption. Germination is inhibited by the trimethylamine contained in the spores [ibid., 11, p. 775], but this substance is absorbed by the soil.

Fókásy (L.). **Kísérletek a búza üszögfertőzésének leküzdésére.** [Experiments on the control of bunt infection of Wheat.]—*Agrártudomány* (*Agricultural Science*), 1, 5, pp. 254–256, 1949. [Russian and English summaries.]

The only successful method of destroying the spores of *Tilletia tritici* [*T. caries*] and *T. foetens* [*T. foetida*] on wheat grain in Hungary [see preceding abstract] is by pickling (Linhart's basket method). As this does not protect from soil-borne infection the grain must also be coated with non-injurious, dry mercury caustic.

Hassebrauk (K.). **Zur physiologischen Spezialisierung des Weizenbraunrostes in Deutschland im Jahre 1938.** [On physiologic specialization of Wheat brown rust in Germany in the year 1938.]—*Arb. biol. Anst.* (*Reichsanst.*), *Berl.*, 23, 1, pp. 31–35, 1940. [Received October, 1949.]

Wheat brown rust [*Puccinia triticina*] samples procured from 104 sources in Germany in 1938 yielded physiologic races 9, 10, 11, 14, 15, 16, 17, 20 (= 13), 25, 26, 31, 53, 58, 93, and 94 [*R.A.M.*, 17, p. 226 and next abstract], among which 20, 16, 14, 11, and 15 predominated. Race 20 was most prevalent in the east, 16 and 14 in central Germany, and 15 in the south and west, while 11 was almost equally distributed throughout the country.

Hassebrauk (K.). **Mit Hilfe neuer Testsorten durchgeführte Untersuchungen über die physiologische Spezialisierung von Puccinia triticina Erikss.** [Studies on physiological specialization in *Puccinia triticina* Erikss. conducted with the aid of new test varieties.]—*Arb. biol. Anst.* (*Reichsanst.*), *Berl.*, 23, 1, pp. 37–50, 1940. [Received October, 1949.]

On the basis of trials of 963 winter wheats for their reactions to brown rust (*Puccinia triticina*) [see preceding abstract], 13 were eventually selected as test varieties, viz., Malakoff (one of the original standard assortment of Mains and

Jackson [*R.A.M.*, 5, p. 477]), Loosdorfer 111, Svalöfs Sonnen I, Hildebrandts Weisser Viktoria, Abundance Gold Coin a, Mettes Rauhweizen, Sizilianischer Binkel, Köstlins, Hohenheimer Bastard, Weisser Kolbenspelz, Jägers Albweizen, Rüfenach 6, Roter Tiroler Spelz, and Rottweiler Dinkel rot St VI. As a result of inoculation experiments on these varieties, which should be substituted in future for those of Mains and Jackson, the number of physiologic races of *P. triticina* was increased from 16 to 45.

Winter (A. G.). **Untersuchungen über die Beziehungen zwischen Ophiobolus graminis und anderen Organismen mit Hilfe der Aufwuchsplattenmethode.** [Studies on the relations between *Ophiobolus graminis* and other organisms with the aid of the 'overgrow' plate method.]—*Arch. Mikrobiol.*, 14, 2, pp. 240–270, 25 figs., 1 graph, 1949.

Using an amplification of Cholodny's 'overgrow' plate method [*R.A.M.*, 15, p. 116] for his continued studies at the Bonn Phytopathological Institute on the relations between *Ophiobolus graminis* and other soil micro-organisms [ibid., 27, p. 123; 28, p. 452], the author observed disintegration of the mycelium of the former, beginning a fortnight after partial sterilization of the soil. This phenomenon, absent in natural soils, was found to be due to a superabundance of actinomycetes either directly parasitizing the hyphae of the wheat pathogen or secreting toxins which act on the soil solution over a wide radius, the latter process being the more important.

In natural soils the hyphae of *O. graminis* are regularly overgrown with bacteria, actinomycetes, and fungi. The last-named show a particularly strong predilection for the vicinity of the parasite, adapting themselves to its mode of growth, sometimes so closely as to complicate differentiation between *O. graminis* and its attendant fungus. This relationship comprises all the transitions from parabiosis [cf. ibid., 28, p. 414] to tolerant and intolerant parasitism, with subsequent destruction and total lysis of the *O. graminis* mycelium. The simplest form of alleloparasitism, consisting in the mutual adaptation of the growth habits of both partners, was also observed. Some of the attendant fungi develop exclusively or predominantly in proximity to *O. graminis*, which stimulates their growth. On the other hand, the development of the wheat parasite is clearly promoted by contact with another soil fungus which it penetrates and ultimately decomposes.

The influence of the rhizosphere of different plants on the development of *O. graminis* is discussed. In addition to plentiful nutriment, the antagonistic buffering of the rhizosphere, due to the qualitative and quantitative idiosyncrasies of the microbial population, exerts a decisive effect on the extent, direction, and habit of mycelial growth in the take-all fungus.

Moore (H. I.). **The problem of lodging.**—*J. Minist. Agric.*, 56, 7, pp. 314–316, 1949.

In an effort to ascertain the cause of lodging the records have been analysed of a large number of wheat, barley, and oat fields in Yorkshire and Lincolnshire during the past 15 years. In only 25 of the 500 fields was lodging due to disease, e.g. [unspecified] foot rot. Lack of phosphate or potassium was the cause in 30 fields. It is concluded that most (nearly 80 per cent.) of the lodging of cereals is preventable, the selection of stiff, short-strawed varieties being the principal remedial measure.

McKinney (H. H.), Stanton (T. R.), Seal (J. L.), Rogers (T. H.), Paden (W. R.), Middleton (G. K.), & Gore (U. R.). **Mosaics of winter Oats and their control in the southeastern States.**—*Circ. U.S. Dep. Agric.* 809, 17 pp., 5 figs., 1949.

The apical and eyespot mosaic viruses [*R.A.M.*, 28, p. 14] attack winter oats in limited areas in Alabama, Georgia, North, and South Carolina. The unidentified,

destructive rosette reaction has appeared in a few hybrid selections, but not in any named varieties. These mosaics have been found mostly in experimental nurseries and are not widespread. Should they become so in the winter oat region, however, very serious damage may be caused among the established varieties. Since infection is favoured by cool autumn temperatures of near 60° to 65° F. over a period of 35 to 60 days the viruses are unlikely to be of economic importance in most areas where oats are sown in the spring.

Experiments showed that virus infestation in the soil can be eliminated by treatment with steam, formaldehyde (1 part in 49 parts water), chloropicrin, or several other chemicals.

The symptoms of mosaic mottling [loc. cit.] usually appear in the field when spring growth starts. In late varieties the symptoms may not appear until the plants are well into the boot stage. All the field and laboratory evidence indicates that these soil-borne viruses are distinct from the soil-borne wheat mosaic viruses [ibid., 29, p. 17 and next abstract] previously studied.

In yield comparisons made in nursery tests, mosaic reduced the grain yield of Letoria oats by approximately 50 per cent. but after soil treatment with chemicals it was increased by approximately 44 per cent. Of 91 named oat varieties tested in mosaic-infested soil, 49 were sufficiently resistant to be regarded as safe for sowing in the infested areas and of these 14 showed exceptionally high mosaic resistance. La Prevision 13 was entirely free from mosaic in the one season it was tested at Experiment, Georgia. Many promising hybrid selections show high resistance and it appears that some of the mosaic-resistant varieties are resistant also to *Helminthosporium victoriae* [see above, p. 81]. Two of the seven wild or minor species of *Avena* (*A. brevis* and *A. fatua*) showed no signs of mosaic.

McKinney (H. H.). **Tests of varieties of Wheat, Barley, Oats, and Corn for reaction to Wheat streak-mosaic viruses.**—*Plant Dis. Reptr*, 33, 10, pp. 359–369, 1949. [Mimeographed.]

Wheat, barley, oats, and maize varieties were tested in the greenhouse at the United States Bureau of Plant Industry for reaction to wheat green and yellow streak-mosaic viruses [? strains of wheat mosaic virus: *R.A.M.*, 29, p. 18]. Of 39 wheat varieties and wheat relatives inoculated by the wiping method with the green strain, all reacted with 100 per cent. mosaic except Arlando, Blackhull, and Brill [ibid., 28, p. 453], which developed 25, 23, and 67 per cent. infection respectively. All plants of each variety inoculated with the yellow strain developed mosaic. The mosaic ranged from mild to severe according to the variety. Some varieties improved as the season advanced; on others the symptoms became more severe.

The same inoculation method used in barley tests produced no symptoms on six barley varieties, but when reinoculated, all plants of all varieties developed mosaic; only light green patterns appeared in those inoculated with the green strain, yellow patterns predominating in plants inoculated with the yellow strain.

Of 24 oat varieties inoculated once with the yellow strain, five expressed mosaic in all the plants, 15 had mosaic in 8·3 to 87·5 per cent., while Red Rustproof, Anthony, Bannock, and Victory had no mosaic symptoms. None of the varieties developed yellow patterns [cf. preceding abstract].

Maize plants of 16 varieties inoculated once with the green strain developed mosaic in 4·8 to 68 per cent. of the plants. Krug, Country Gentleman, Early Evergreen, Golden Colonel, and Stowell's Evergreen Hybrid expressed no mosaic.

Leukel (R. W.). **Cooperative tests of seed treatments on spring grains in 1949.**—*Plant Dis. Reptr*, 33, 10, pp. 370–378, 1949. [Mimeographed.]

Further co-operative field seed treatment tests [see above, p. 90] were carried out in the spring and summer of 1949 at 11 experiment stations in various parts of

the United States, using Odessa barley heavily infected with *Ustilago hordei* and a barley mixture infected with stripe [*Helminthosporium gramineum*], Canadian oats heavily infected with *U. avenae* and *U. kolleri*, Wayne oats lightly infected with both the preceding, and Ulka wheat inoculated with bunt [*Tilletia foetida*]. Seedox and dow 9–B significantly decreased the percentage of emergence in Ulka wheat and Wayne oats in greenhouse tests at Beltsville, Maryland, while seedlings from seed treated with panogen or ceresan (new improved, M, and M slurry) prior to storage for about six months (winter oats for one year) were more vigorous than those from untreated seed and the percentages of emergence were mostly higher. There was a wide range in the percentages of infection developing in plants from the untreated seed at different stations. With a few exceptions, n.i. ceresan, ceresan M, and ceresan M slurry (all at $\frac{1}{2}$ oz. per bush.) and panogen (at $1\frac{1}{2}$ oz. per bush.) [cf. *R.A.M.*, 28, p. 567] controlled completely *U. avenae* and *U. kolleri* in Canadian oats, *U. hordei* and stripe in barley, and bunt in wheat. Phygon XL and arasan were relatively unsatisfactory in the control of the oat smuts, while apparently effective in eliminating covered smut in barley and in most cases bunt in wheat. Spergon was fairly effective in reducing the incidence of bunt to less than 1 per cent. Seedox and dow 9–B were highly unsatisfactory.

Taylor (J. W.) & Leukel (R. W.). **Effect of seed treatment on yields of Wheat from disease-free seed.**—*Plant Dis. Reptr*, 33, 10, pp. 380–381, 1949. [Mimeographed.]

The results of an experiment conducted during 1948–9 showed that various fungicidal treatments of disease-free Purplestraw wheat seed did not increase yields in a silt loam soil low in organic matter. It is possible, however, that in some rich soils infested with certain pathogens treatment of sound seed may increase yields because of its protective effect [cf. above, p. 90].

Rupert (J. A.) & Borlaug (N. E.). **Downy mildew of Wheat in Mexico.**—*Plant Dis. Reptr*, 33, 10, pp. 382–383, 1949. [Mimeographed.]

In the season 1945–6 downy mildew of wheat (*Sclerospora macrospora*) [*R.A.M.*, 27, p. 13] occurred in two areas in Mexico. It reappeared sporadically in the following season, and during 1948–9 caused economic losses at Torreon, Coahuila, in the Laguna area, infecting up to 60 per cent. of plants in low lying, wet fields, while 2 to 3 per cent. of plants in well drained soils had distorted spikes. Similar symptoms of distortion have been observed in both cultivated and wild oats.

Fenaroli (L.). **Il 'nanismo' del Mais.** ['Dwarfing' in Maize.]—*Notiz. Malatt. Piante*, [*1949*], 3, pp. 38–39, 1949. [Mimeographed.]

In recent years, maize growing in Upper Italy has been rather commonly affected by dwarfing [cf. *R.A.M.*, 24, p. 498 and next abstract], with consequent sterility. The affected plants are small and the stems are rigid and usually thickened at the base, rapidly thinning towards the apex, with shortened internodes. Sometimes the tissues under the nodal septa are brown; in severe cases the male inflorescence does not form or remains sterile, while the female inflorescence is nearly always lacking. Dent maize appears to be most affected. Investigations into the etiology of the condition are in progress.

Grancini (P.). **Notizie sul 'nanismo' del Mais in Lombardia.** [Notes on Maize 'dwarfing' in Lombardy.]—*Notiz. Malatt. Piante*, [*1949*], 3, pp. 39–41, 1949. [Mimeographed.]

In 1948, dwarfing occurred in a few maize plants near Milan [see preceding abstract] and again in 1949 on the local varieties, while it was also very severe on some American hybrids. It was very prevalent round Milan and appeared to be

unrelated to soil factors. Plants on the edges of fields, however, were much more affected than those in the middle of the same fields (20 and 5 per cent., respectively, at Pioltello), and the affected plants were usually confined to patches.

The symptoms consisted in the reduced length of every organ and very poor root development. The stem was of normal diameter at the base, with shortened internodes. When the condition declared itself early and all the internodes were shortened, the plants attained a height of only about half a metre, failed to flower, and quickly died. On the apical leaves there were frequently intervenal stripes along their entire length, together with a reddish discoloration, sometimes followed by premature withering of the whole plant. The tassels were only one-half or one-third normal length, and many caryopses failed to develop. Internode shortening became progressively more conspicuous towards the apex. In short, healthy plants an appreciable length of the base of the tassel axis was unbranched, but in affected plants, even if they reached almost normal height, the tassel emerged only partly from the last leaf sheath. The author has found this a useful diagnostic character. Investigations to ascertain the cause of the trouble are in progress.

Johnson (A. G.), Robert (Alice L.), & Cash (Lillian). **Bacterial leaf blight and stalk rot of Corn.**—*J. agric. Res.*, 78, 12, pp. 719–732, 2 pl., 4 figs., 1949.

The symptoms are described of a bacterial disease of maize, first reported from Alabama [*R.A.M.*, 8, p. 374]; it has since occurred sporadically in several southern and central States, but it is of minor importance. The causal organism was identified as *Pseudomonas alboprecipitans* [ibid., 18, p. 517]. The white, Gram-negative bacterium, which is motile by a single polar flagellum, produces acid but no gas from all carbohydrates tested. The optimum temperature for growth is 30° C., maximum 52°, minimum below 10°. It reduced nitrate rapidly, produced ammonia and some hydrogen sulphide, but no indole. Starch was hydrolyzed, milk peptonized slowly without coagulation, litmus reduced, and gelatin liquefied.

The pathogenicity of *P. alboprecipitans* was established in greenhouse inoculation tests (at 85° to 95°) in which dent and sweet corn (*Zea mays* var. *saccharata*), wheat, oats, barley, rye, and *Setaria lutescens* were readily infected by spraying the leaves with water suspensions of the bacterium. Light infections were obtained on *S. geniculata*, sorghum, and Sudan grass. Inoculations of maize stalks resulted in stalk infection. Kernels of dent and sweet corn soaked in water suspensions of the bacterium prior to planting in sterile soil in the greenhouse produced infected seedlings, while corresponding controls remained healthy. Variants of the typical colonies were pathogenic to maize and *S. lutescens*. Inoculated cabbage, carrot, potato, and turnip developed a distinct soft rot.

Leukel (R. W.). **Tests of Sorghum seed treatments in 1949.**—*Plant Dis. Reptr*, 33, 10, pp. 378–381, 1949. [Mimeographed.]

Further tests on the effects of various fungicides on the emergence and control of smut (*Sphacelotheca sorghi*) [cf. *R.A.M.*, 28, p. 284] in seed of Sharon kafir and Leoti sorgo [*Sorghum saccharatum*] were carried out at the Plant Industry Station, Beltsville, Maryland, in 1949. Many of the fungicides tested caused a marked improvement in emergence at 20° and 25° C., phygon being specially effective. Ceresan M ($\frac{1}{2}$ oz. per bush.), ceresan M slurry ($\frac{1}{2}$ oz.), panogen ($\frac{3}{4}$ oz.), and aagrano ($\frac{1}{2}$ oz.) [ibid., 28, p. 567] completely eliminated smut in both varieties. Spergon, arasan, and phygon XL slurry (all at 2 oz. per bush.) gave perfect control in kafir and reduced infection to less than 2 per cent. in Leoti. Mercuran A.S. (applied as dust at $\frac{1}{2}$ oz. per bush.) eliminated smut in Leoti but not in kafir. Mercuran A.L. (wet-dry treatment at 1 oz. per bush.) controlled smut in kafir, but was relatively ineffective against the disease in Loti.

Ciccarone (A.). **Zonate leaf spot of Sorghum in Venezuela.**—*Phytopathology*, 39, 9, pp. 760–761, 1949.

In September, 1947, a new kind of leaf spot was observed in some experimental plots of grain sorghum at Maracay, Aragua, Venezuela. The seed had been collected in Asia and Africa and multiplied in the United States. Subsequently the disease spread to other localities. The lesions consisted of subcircular spots with alternating dark and light bands and, in the early morning, a watersoaked halo. Within 24 hours in a moist chamber, yellow-grey clusters of short conidiophores developed in longitudinal lines in the pale zones. They bore filiform, pluriseptate, arcuate, unbranched, hyaline conidia, 46·5 to 139 or up to 148 (average 102·5) by 1·4 to 3 μ. Sclerotia measuring 80 to 190 μ in diameter were produced in naturally infected leaves kept for some time in a moist chamber, and on potato dextrose-peptone agar they appeared within 10 to 12 days; they were not observed in the field, where the leaves probably decay too rapidly to permit the formation of the resting stage. The fungus was identified by Dr. L. S. Olive as *Gloeocercospora sorghi*, the agent of zonate leaf spot of sorghum and other grasses in the United States [*R.A.M.*, 22, p. 302; cf. also 29, p. 85]. This is the first report of its occurrence in South America. There is also a record from Tanganyika Territory [ibid., 24, p. 443; 27, p. 158].

Hughes (W. A.) & Lister (C. A.). **Lime disease in the Gold Coast.**—*Nature, Lond.*, 164, 4177, p. 880, 1949.

The symptoms of a virus disease of seedling lime trees in the Gold Coast [*R.A.M.*, 28, p. 162] caused by one strain of the virus, are a one-sided death of the trees coupled with veinal fleckings on the young leaves and severe pitting of the leaves and branches; and by another, conspicuous dwarfing together with the usual veinal symptoms and subsequent death. Most kinds of sweet citrus and rough lemon appear to be symptomless carriers of the virus. Experiments proved *Aphis tavaresi* [ibid., 27, p. 564] to be the vector.

Frezal (M.). **L'agrumiculture algérienne. Comité consultatif de l'agrumiculture. Réglementation du contrôle de la psorose dans les plantations d'arbres étalons et les pépinières.** [Algerian Citrus cultivation. Consultative committee on Citrus cultivation. Regulation for the control of psorosis in plantations of scion trees and in nurseries.]—*Fruits & Primeurs*, 19, 202, p. 154, 1949.

In recent years there has been an alarming spread of orange psorosis [citrus psorosis virus] in Algeria [*R.A.M.*, 24, p. 225; 27, p. 319]. In the spring of 1949 some plantations under ten years of age showed distinct wilting of certain trees. Susceptible varieties, which formerly appeared to include only Navel and Late Valencia (at least as regards cortical symptoms), are now much more numerous. Bark excoriosis has been observed on Portugaise trees, while leaf chlorosis was noted on every variety examined, including ungrafted bigaradia [*Citrus aurantium* var. *bigaradia*] trees grown from seed.

To estimate the potential amount of infection present in the citrus breeding establishments in Algeria a survey was made of standard trees and of grafted and ungrafted nursery stocks, which showed over 10 per cent. affected trees among the former and 1,832 affected seedlings in 11 nurseries. These figures show that the inspection of nursery establishments must be made more stringent. The use of healthy trees only, as determined by inspection, for parental material is essential [ibid., 27, p. 128]. Stocks, even when obtained from seed, also require careful inspection.

The following recommendations are made. Healthy parents should be selected and temporarily registered after inspection of all scion trees aged 15 years or over. The selected trees should be grown in a special nursery and if proved by grafting

to be healthy should then be permanently registered. Nurseries should be inspected and all seedlings showing typical chlorosis destroyed. Plots of completely healthy scion parents should be established for multiplication purposes. These measures should eradicate the disease in 30 to 40 years.

McCubbin (W. A.). **Citrus canker survey is negative.**—*Plant Dis. Reptr*, 33, 10, pp. 394–395, 1949. [Mimeographed.]

In the winter seasons of 1947–8 and 1948–9 a thorough re-survey of Texas citrus areas revealed no canker (*Xanthomonas citri*) [*R.A.M.*, 20, p. 531], thus indicating that this disease has been completely eliminated.

Wager (V. A.). **The occurrence of the black-spot fungus in the Citrus areas of South Africa.**—*Fmg S. Afr.*, 24, 281, pp. 367–369, 374, 3 figs., 1949.

This is a full account of the distribution of the black spot fungus (*Phoma* [*Guignardia*] *citricarpa*) in citrus areas in South Africa, a preliminary report of which has already been noticed [*R.A.M.*, 28, p. 122]. The survey showed that the fungus was absent from the western part of the western Transvaal and the western Cape Province, with the exception of the Swellendam area. The farmers in these areas are advised not to import nursery trees from any region where the fungus occurs, even in its latent form. In the eastern Cape Province and north and central Transvaal, where the fungus is only latent, nursery trees should not be obtained from areas where the disease is visible.

An experiment was conducted at the Botanical Station, Durban, in which wire baskets, containing badly spotted oranges, were hung on 50 citrus trees, all with latent infections but no visible symptoms. Half the baskets were left for four months, starting prior to petal drop; the other half were taken away every night and also during rains. Black spot developed on maturing fruits only on trees where the baskets had been allowed to get wet. No further black spots have developed during the last two years on any of the trees. The results indicate that special conditions are apparently necessary for the disease to become established in an area. However, visible symptoms have appeared under greatly differing climatic conditions and in many different soil types, and the author fears that in time black spot will probably appear in most citrus-growing areas of the Union.

Suit (R. F.). **Recent experiments on melanose control with reference to organic fungicides and dormant sprays.**—*Citrus Ind.*, 30, 2, pp. 8, 18, 1949. [Abs. in *Docum. analyt.* (*Suppl. Fruits d'Outre-Mer*, 4, 8), 6, 8–9, p. 137, 1949.]

Organic fungicides have not given good results against citrus melanose [*Diaporthe citri*: *R.A.M.*, 23, p. 339; 24, p. 306]. Recent work [? in Florida: see above, p. 88] has shown that copper, to be effective, must be applied one to three weeks after fruit set.

Kiely (T. B.). **Blue and green mould rots of Citrus fruits.**—*Agric. Gaz. N.S.W.*, 60, 9, pp. 465–466, 1 fig., 1949.

From time to time considerable loss is caused in all species of *Citrus* by the blue and green mould rots (*Penicillium italicum* and *P. digitatum*) in coastal areas and sometimes inland irrigation areas in New South Wales. The author describes these rots and their control and stresses the importance of careful handling of the fruit at all stages [*R.A.M.*, 23, p. 104; 28, p. 625].

Aldrich (D. G.) & Haas (A. R. C.). **Response of Lemon trees to phosphorus and potassium.**—*Calif. Citrogr.*, 35, 1, pp. 5, 22–24, 2 figs., 1949.

It has been found as a result of tree injection experiments on Eureka lemon during the past year in California orchards, that the leaf symptoms previously described as indicative of low potassium content [*R.A.M.*, 29, p. 24] are now known to result

from both low potassium and low phosphorus contents. A marked increase of both elements (previously low) in the leaves and a considerable improvement in growth and colour occurred after the injections, the effect being greatest when the elements were in combination (in the form of dipotassium phosphate). These responses to injections have occurred only where the potassium and phosphorus content is low in the soil and leaves.

KNORR (L. C.). **A gall of Tahiti Lime and other Citrus species caused by dodder.**—*Phytopathology*, 39, 8, pp. 616–620, 2 figs., 1949.

A gall of Tahiti lime (*Citrus aurantifolia*) branches, similar to that induced by *Sphaeropsis tumefaciens* [*R.A.M.*, 27, p. 564], was observed at Winter Haven, Florida, in 1948. Closer inspection, however, revealed the dextrorse spiral arrangement characteristic of parasitism by a dodder, the species involved in this case being *Cuscuta americana*. On recently infected stems the band of slightly raised, pale bark contains regularly spaced, oval craters, former sites of the haustoria, 1·5 by 1 mm. in diameter. On other stems discrete, pale, lenticular or circular craters may ascend the twig in a spiral. The oldest infections, which are particularly reminiscent of *S. tumefaciens*, consist of roughly globoid tumours with hard, woody excrescences covered by bark, sometimes paler than normal and somewhat scaly. Occasionally the galls coalesce to form a continuous ridge. Most affected stems bear eight galls per spiral revolution.

About half the twigs on a quarter of the worst affected lime tree bore dodder galls, which numbered 163 on seven twigs totalling 85 in. in length. Cross-sections of the older galls disclosed hypertrophy of the tissues overlying the cortex, while conical plugs of resinous material pierced the oldest tumours, no longer harbouring the dodder, to the cortex.

No appreciable overgrowths are produced by the same species of dodder on orange and grapefruit, on which the symptoms are limited to crater-like processes. Dodder galls lead to a stunting of twig growth and are the seat of haustoria that remain to regenerate aerial vines after the ostensible eradication of the parasite. Control in limes may be effected by pruning out the diseased wood or cutting back the trees, the ground beneath which should be cultivated to preclude reinfection by the seedlings arising in the following spring from the dodder seeds.

MALLAMAIRE (A.). **Les pourridiés du Caféier en Afrique occidentale.** [Root rots of Coffee in West Africa.]—*Agron. trop.*, 4, 9–10, pp. 508–512, 6 figs., 1949.

Root rot [*R.A.M.*, 26, p. 104] is very destructive in West African coffee plantations, especially during the dry season when severe defoliation occurs, often followed by the death of the trees. The disease lies dormant for several months beforehand, the parasite being discovered only when the dying roots are removed. The fructifications of *Fomes lignosus* [ibid., 28, p. 272], *F. lamaoensis* [*F. noxius*: ibid., 18, pp. 579, 728], or *Armillaria mellea* sometimes appear on the dead roots after they have been thrown away. These fungi may infect the tap and lateral roots of healthy trees by means of spores emitted by sporophores developing on old stumps.

Apart from the use of hygienic cultural methods, the only preventive method which has given good results against *Fomes* root rots is that used on rubber in the Belgian Congo [ibid., 27, p. 382], and it is recommended for coffee, cacao, and rubber trees two years old or more. The mycelium is scraped off bared roots which are then treated with Bordeaux paste or tar. If the damage is too extensive the diseased roots should be burnt.

Recent examination have indicated that all the coffee varieties grown in West Africa are subject to root rot. A. *robusta* stock developed at the Gagnoa Agricultural Station appears to be resistant to the disease, but until this is confirmed and seed

production intensified, growers are advised to graft their trees on to resistant stocks.

In a note R. Portères states that in the Ivory Coast [ibid., 15, p. 16] *Coffea canephora* var. *laurentii* and its indigenous varieties 'Lulla', 'Ineac', 'Yangambi', 'Man A. 5', and 'Robusta Congo belge' from central Africa are more susceptible to *F. lignosus* than var. *maclaudii* and the indigenous varieties 'Petit Indénié', 'Touba', and 'Dianlé' from the northern border of the West African forests. The susceptibility is of a varietal nature and must be taken into account in selection centres.

Steinhaus (E. A.). **Principles of insect pathology.**—ix+757 pp., 219 figs., New York, McGraw Hill Book Company Inc., 1949. $8.00.

The author of this important book deals exhaustively with every aspect of his subject. Chapters are devoted to each class of organism and agency involved in the diseases of insects, and among these the fungus parasites [*R.A.M.*, 19, p. 593] receive adequate attention in 99 pages. The significance of fungi is also fully considered in chapters concerned with extra- and intracellular microbiota, in which phenomena of symbiotic and other close relationships are discussed, including such cases as those of *Septobasidium*, the ambrosia fungi, and ant termite gardens; resistance and immunity; symptoms and pathologies; and applied biology and biological control, including the use of entomogenous fungi. Extensive bibliographies follow each chapter.

Arnaud (G.). **Une nouvelle maladie des plantes horticoles.** [A new disease of horticultural plants.]—*C.R. Acad. Agric. Fr.*, 35, 12, pp. 496–497, 1949.

Since August, 1945, *Cylindrocladium scoparium* [*R.A.M.*, 10, p. 792; 27, p. 462; 28, p. 22], not previously recorded from France, has been observed on ivy (*Hedera helix*) leaves near Versailles. Apparently *Candelospora citri* [ibid., 16, p. 668] and *Tetracytum lauri* [ibid., 27, p. 463] belong to this species or are closely related to it. *Cylindrocladium scoparium* possibly has two different forms, one with spores 40 to 60 μ, the other 80 to 120 μ long, the form on ivy being of the latter type. The spores are highly characteristic, being shaped like cylindrical rods and arranged (in dry weather) in groups of five to ten, so that they are visible to the naked eye on the ivy leaf; they show up against the brownish-green of the leaf spots as pearly- or silky-white rods.

Vlitos (A. J.) & Preston (D. A.). **Seed treatment of field legumes.**—*Phytopathology*, 39, 9, pp. 706–714, 1949.

In field and greenhouse tests carried out at the Oklahoma Agricultural Experiment Station from 1946 to 1948 to determine the relative efficacy of various chemicals in [unspecified] damping-off control, the increase in germination of lucerne seed treated with phygon at dosages of 1, 0·5, and 0·25 per cent. by weight of seed was highly significant as compared with untreated. Arasan and dow 9B at 1, and spergon at 0·5 per cent. also improved germinability but were less effective than phygon. The same compounds proved equally satisfactory as protectants for mung bean [*Phaseolus mungo*] (especially phygon), Chinese red cowpea, and yellow hop clover seed, the last-named responding most consistently to spergon. Arasan at all dosages gave the maximum increase in germination of hairy vetch, though phygon and spergon at 0·25 per cent. were also beneficial.

Nodulation was not inhibited by chemical treatment of the above-mentioned legumes and Austrian winter peas when disinfection was followed by inoculation with nitragin bacterial inoculum [*R.A.M.*, 28, p. 266], and in the case of lucerne and cowpea nodule formation was actually enhanced by seed treatment with phygon or arasan, supplemented by nitragin.

Hardison (J. R.). **Blind seed disease of perennial Ryegrass.**—*Circ. Ore. agric. Exp. Sta.* 177, 11 pp., 2 figs., 1 diag., 1949.

Failure to recognize the seriousness of the disease situation and adverse weather conditions combined to prevent in 1948 the necessary control measure of ploughing before 15th May the many fields of perennial rye grass [*Lolium perenne*] badly affected by *Phialea temulenta* in Oregon [*R.A.M.*, 27, p. 478 and above, p. 83]. Losses were consequently greater than in the 1943 crop, before the control campaign started.

Once badly diseased fields have been ploughed up, perennial rye grass should not be planted there again for two years. Heading should be prevented in pastures until after the regular seed harvest period, and all rye grass screenings should be burnt. 'Buckcheat' or darnel (*L. temulentum*) should not be grown with new plantings of perennial rye grass, and all plantings of this crop on a farm should be ploughed at the same time to prevent the disease being carried over between crops.

Sprague (R.). **Some leafspot fungi on western Gramineae–IV.**—*Mycologia*, 41, 5, pp. 493–504, 1 fig., 1949.

This is a further annotated list of fungi causing leaf spots on Gramineae in the western United States [cf. *R.A.M.*, 27, p. 527] (and *Mycologia*, 40, pp. 295–313, 1948). They were exceptionally abundant in the Washington area in 1948 owing to prolonged cool and very humid periods. It includes two new species, one of which, *Gloeosporium meinersii* n.sp., occurs on living leaves of *Phleum pratense*, and *Erysiphe graminis* on a new host, *Calamagrostis rubescens*.

Hutton (K. E.). **Crown gall of plants.**—*Agric. Gaz. N.S.W.*, 60, 9, pp. 467–469, 6 figs., 1949.

Crown gall bacteria (*Agrobacterium* [*Bacterium*] *tumefaciens*) are widely distributed throughout the orchard soils of New South Wales. In fruit tree nurseries frequently 10 to 20 per cent. of each planting has to be rejected and losses may be 80 per cent. The author gives control measures for the nursery and orchard [*R.A.M.*, 16, p. 42].

Goldsworthy (M. C.), Dunegan (J. C.), & Wilson (R. A.). **Control of Apple scab by ground and tree applications of eradicant fungicides.**—*Plant Dis. Reptr*, 33, 8, pp. 312–318, 1949. [Mimeographed.]

During the past three years several small apple orchards at the Plant Industry Station, Beltsville, Maryland, have been treated against scab (*Venturia inaequalis*) (*a*) by spraying the orchard floor just before bud break with elgetol (0·5 per cent. by volume, 400 gals. per acre) [*R.A.M.*, 27, pp. 174, 356], and (*b*) by the application to the young leaves, flowers, and very small fruits of 5 per cent. puratized agricultural spray at 1 pint per 100 gals. water [see above, p. 84]. In September, 1947, Stayman Winesap trees, which received an elgetol ground spray followed by puratized at pre-blossom and petal-fall (calyx) stages, had 6 per cent. diseased leaves compared with 94·6 on those receiving ground spray only, the corresponding figures for Delicious being 2·7 and 65·7.

In 1948, a similar experiment was conducted in the same orchard, using puratized at petal-fall only, the ground spray being given on 30th March about a week before bud break. The leaf scab counts on Delicious were 92·6 (ground only) and 13 per cent. (ground and tree) with 61 and 16·2 per cent. fruit infection, respectively, the corresponding figures for Stayman Winesap being 92·8 and 22·4 and 70 and 2 per cent.

In the 1949 experiment, phenyl mercury acetate ($\frac{1}{2}$ pint of a 10 per cent. solution in 100 gals. water) was used in place of puratized at the same rate and during petal-fall only; counts in May showed that 16·1 per cent. of the leaves on the treated

Delicious trees and 67·5 per cent. of those of the untreated were affected, the corresponding figures for Stayman Winesap being 26·4 and 60·3 per cent.

A commercial test was carried out near Cheswold, Delaware, on mature Delicious, Rome Beauty, and Grimes Golden trees, severely infected at the start. The 1947 schedule was followed in 1947 and 1948, several applications of wettable sulphur being made during the cover period. In 1949, when only half the orchard floor was treated and puratized was applied over the whole orchard only at petal fall, 3 per cent. of the Delicious leaves in the floor-treated part and 36·8 in the untreated were affected in May, the corresponding figures for Rome Beauty being 4·7 and 26·8 per cent.

These results indicate that the use of eradicant fungicides applied in two steps appears to offer promise in the control of scab by eliminating much of the ascospore inoculum in the diseased leaves lying on the ground and by eradicating the early infections which develop on leaves and fruits.

[An account of this work also appears in *Agric. Chemicals*, 4, 9, pp. 47, 49, 77.]

Vuittenez (A.). **Un appareil simple pour étudier la projection des ascospores de la tavelure dans les conditions naturelles.** [A simple apparatus for studying the projection of ascospores of the scab pathogens under natural conditions.]—*Rev. Path. vég.*, 28, 2, pp. 118–125, 1 fig., 1 diag., 1949.

The author has devised an apparatus by which ascospores of apple and pear scab (*Venturia inaequalis* and *V. pirina*) may be trapped rapidly and effectively in orchards. It consists of a glass funnel connected to a tube passing into a rubber-stoppered bottle to which a suction pump is attached. The apparatus is placed on the ground near some dead leaves [from an infected tree] so that the funnel faces the direction from which the wind is coming. Air is sucked into the bottle and all solid particles adhere to a drop of nutrient medium on a plate 5 mm. below the 2 mm. orifice of the glass entry tube. After from 10 mins. to 2 hours the plate is changed. In showery weather the plates are practically free from extraneous matter.

By a study made in an orchard at the Station Centrale de Pathologie Végétale during April, 1948, it was confirmed that major ascospore dispersal of *V. pirina* occurs during rainy periods, sharp showers being particularly favourable. On 5th and 17th April, when the rainfall was 15·2 and 18 mm., respectively, the number of ascospores trapped 15 cm. from the ground reached the maximum figures of 9,600 and 8,000 per hour, respectively, or 25 and 20 ascospores per l. of air. These figures are higher than those obtained in Wisconsin [*R.A.M.*, 6, p. 299] or Switzerland [ibid., 14, p. 589]. A few ascospores were still being emitted several days after the rain had fallen, but when rainfall was nil the number was never over 600 unless the leaves were wet. Ascospores trapped on slides both during rain and 10 days later, and incubated at 20°, gave 80 per cent. germination.

Byrde (R. J. W.). **Experiments on the control of brown rot of fruits : progress report, 1947–48.**—*Rep. agric. hort. Res. Sta. Bristol, 1948*, pp. 161–173, [? 1949].

In studies on the control of brown rot (*Sclerotinia fructigena* and *S. laxa*) [*R.A.M.*, 28, pp. 222, 323, 406] diseases of fruit, winter spraying trials were carried out on mummified apple fruits infected with *S. fructigena* overwintering on 40-year-old Bramley's Seedling bush trees. Tests were also conducted on detached mummified apples of four varieties and plums [ibid., 27, p. 371] of mixed varieties.

The results of preliminary spore germination tests by the test tube dilution slide-germination method showed that phenyl mercury chloride, 8–hydroxyquinoline sulphate, 2:3 dichloro–1:4 naphthoquinone, and 2–heptadecylglyoxalidine had a strongly fungistatic effect on *S. laxa*. In the field trials copper naphthenate

winter sprays consistently failed to inhibit satisfactorily pustule production by *S. fructigena*. Phenyl mercury chloride displayed considerable promise both as a winter and as a summer spray. As a winter spray it has a great advantage over the arsenites in that it is comparatively safe and pleasant to use; it also appears to be less phytotoxic, though in laboratory tests its toxicity to *S. fructigena* was outstanding. It was, however, erratic in its action on the mycelium of *S. fructigena* in mummified apples. The surface of some of these appeared to be completely sterile, while on others vigorous pustules were produced. When a wetting agent was incorporated in the spray, better results were obtained. One application on 23rd June, 1948 of 0·2 per cent. phenyl mercury chloride (venturicide) gave good control of the current season's brown rot on 40-year old Belle de Louvain plum trees, with 5·6 per cent. infection compared with 22 per cent. in the unsprayed; the absence of visible residue was a great advantage.

Monocalcium arsenite at 0·25 per cent. plus oil as a winter spray showed good eradicant properties; pustules developed in the succeeding summer on mummified, attached apples on trees of four varieties only when an appreciable amount of rain followed the spraying. In small-scale trials on detached mummified apples, 0·1 per cent. sodium arsenite and a copper sulphate–lime–monocalcium arsenite mixture were both effective. There was some indication that the particular value of monocalcium arsenite may be its penetrating power, killing the mycelium of *S. fructigena* throughout the mummified tissue of the fruit. There was considerably less pustule production on trees receiving routine DNC winter sprays.

It is emphasized that the results of the winter spraying trials described refer only to the inhibition of spore formation by mummified fruits.

Baldacci (E.), Catoni (G.), Ciferri (R.), Marimpietri (L.), & Refatti (E.). **Relazione sui dati e le esperienze circa la 'moria' del Pero nella Venezia Tridentina (Trentino ed Alto Adige).** [Report on data concerning and experiments on Pear 'decline' in Tridentine Venezia (Trentino and Alto Adige).]—*Notiz. Malatt. Piante*, [*1949*], 4, pp. 1–51, 3 pl., 1 map, 1949. [Mimeographed.]

This report of a commission officially appointed to investigate the pear decline prevalent in northern Italy [*R.A.M.*, 28, p. 579] covers the work done from April, 1947 until September, 1949. It deals with the history of the disease, its economic importance, symptoms, geographical distribution, etiology, epidemiology, and control.

Attempts to transmit the disorder mechanically failed, but as all other causes appear to be excluded, the view is tentatively adopted that the condition which in many of its symptoms resembles quick decline or 'tristeza' of citrus [ibid., 27, p. 132; 28, p. 522], is of virus origin and occurs when certain varieties are grafted on to certain stocks. Further work is in progress.

Thind (K. S.) & Keitt (G. W.). **Studies on variability of Sclerotinia fructicola (Wint.) Rehm.**—*Phytopathology*, 39, 8, pp. 621–636, 2 figs., 3 graphs, 1949.

In studies at the Wisconsin Agricultural Experiment Station on 29 apothecia of *Sclerotinia fructicola* [*R.A.M.*, 23, p. 180] from the States of Washington, Illinois, and Michigan, the eight monoascospore lines from each of the 36 asci, isolated in order of their linear arrangement in the ascus [ibid., 21, p. 208] and plated singly on potato dextrose agar at 24° C., fell into four distinct pairs on the basis of colony characters. The four pairs from each of the asci 1, 2, and 17 were likewise clearly differentiated within the temperature range at which growth occurred (8° to 32°), with an optimum at 24°. The four pairs from ascus 10 were distinguished on the basis of colony characters within the pH range of 2 to 9 (optimum 4 to 5). Suitably disposed on the same potato dextrose agar plate, the eight monoascospore isolates

from each of the 36 asci also fell into four distinct pairs with dark lines between them. In the case of asci 1, 8, 10, and 17 dark lines were formed between any two pairs of the same ascus, and they also developed whenever any pair from ascus 10 was in proximity to a pair from any of the asci 1, 8, 17, and 25. No dark line was ever detected between the two members of one pair. The mycelium of the dark lines, some of which were faint and narrow and others very dark and thick, was apparently of a sclerotial character, producing abundant microconidia.

It is concluded that each monoascospore pair differed genetically from all the others, whether from the same ascus or different ones. Evidently, therefore, segregation of genetic factors occurs in the asci of *S. fructicola* and each ascus contains four biotypes.

Gaudineau (Mlle M.). **L'Oidium ou blanc du Pommier.** [Apple *Oidium* or mildew.] —Reprinted from *Fruit belge, 1949*, 89, 4 pp., 1 fig., 1949.

In this pamphlet on apple mildew (*Podosphaera leucotricha*), which has spread noticeably in France since 1945 [*R.A.M.*, 26, p. 32; 27, p. 425], notes are given on the symptoms, varietal reactions of apples and pears, and methods of control [ibid., 28, p. 461]. In 1947 in south-west France, Winesap and Wagener apple trees suffered considerably less than Jonathan and Morgendurf, which had 35 and 24 per cent., respectively, affected shoots.

Wilson (E. E.). **Effect of Bordeaux and petroleum oil on the eradicative action of monocalcium arsenite against Sclerotinia laxa in Apricot trees.**—*Plant Dis. Reptr*, 33, 7, pp. 287–289, 1949. [Mimeographed.]

In further experiments carried out in 1949 in California on the control of *Sclerotinia laxa* [*R.A.M.*, 21, p. 421; 25, p. 404] in apricot trees, a preparation containing 4–4–10 Bordeaux, 3 lb. per 100 gals. monocalcium arsenite [see preceding page], and ½ per cent. petroleum oil [ibid., 28, p. 222] was compared with 3–100 monocalcium arsenite alone on blighted twigs in mid-January, when few sporodochia were present; they developed, however, in large numbers during February. In addition all trees received 10–10–100 Bordeaux at the pre-blossom stage. Orchards in the neighbourhood had an average of 21 per cent. blighted blossoming twigs. The results demonstrated that the addition of 4–4–100 Bordeaux and ½ per cent. petroleum oil had no significant effect on the eradicant action of the monocalcium arsenite, which reduced sporodochial development by from 58 to 91 per cent., and twig infection by from 75 to 99 per cent.

Hutchins (L. M.) & Rue (J. L.). **Natural spread of phony disease to Apricot and Plum.**—*Phytopathology*, 39, 8, pp. 661–667, 2 figs., 1949.

This is an amplified, tabulated account of observations and experiments in Georgia establishing the fact of natural spread of phony peach virus to two species of apricot and three of plum, a preliminary note on which has already appeared [*R.A.M.*, 29, p. 34].

Gaudineau (Mlle M.). **Le Gnomonia du Cerisier.** [*Gnomonia* on Cherry trees.]— Reprinted from *Fruit belge, 1949*, 91, 3 pp., 1 fig., 1949.

The author traces from the literature the distribution and incidence of *Gnomonia erythrostoma* on cherry trees [*R.A.M.*, 17, p. 755], which in 1946 appeared to be increasing in the region of Orleans and Olivet in France, and in the south-west has been spreading every year since 1943. The characteristic features of the disease are described and the method of control advocated is to spray with 2 per cent. Bordeaux mixture in mid-February when the perithecia mature, before flowering, and at petal-fall.

Lewis (F. H.) & Kirby (R. S.). **Sulfur injury to sour Cherry petals.**—*Plant Dis. Reptr*, 33, 7, p. 290, 1949. [Mimeographed.]

Following the effective control of *Coccomyces hiemalis* [*R.A.M.*, 28, p. 219] on sour cherries with compound 341 in southern Pennsylvania in 1947, practically all growers in 1948 used lime-sulphur (2 in 100) starting at the pink stage without any injury occurring with this or any of the materials used experimentally. On 23rd April 1949, however, after some periods of cold weather when sour cherries were approaching full bloom, many dead petals (regardless of exposure) in some orchards in Adams County appeared to have been injured directly or indirectly, by sulphur pre-bloom applications. In one instance, lime-sulphur in the pink spray killed about 80 per cent. of the petals, while adjacent unsprayed trees and others sprayed with Bordeaux mixture showed no injury. The trees set a fair crop of fruit in spite of the petal injury. It is suggested that the actual petal killing was due to low temperature and that the effect of the sulphur was indirect.

Hahn (G. G.). **Further evidence that immune Ribes do not indicate physiologic races of Cronartium ribicola in North America.**—*Plant Dis. Reptr*, 33, 7, pp. 291–292, 1949. [Mimeographed.]

Although evidence obtained in exposure tests in the United States and Canada with Viking red currant [*R.A.M.*, 28, p. 340] and the Canadian hybrid black currants Crusader and Coronet [ibid., 28, p. 631] indicates that physiologic races of *Cronartium ribicola* do not occur, the author considers that their non-existence has not been definitely established, but that if there are races then they do not grow and fruit on these three rust-immune varieties.

Zentmyer (G. A.). **Verticillium wilt of Avocado.**—*Phytopathology*, 39, 9, pp. 677–682, 3 figs., 1949.

This is an expanded account of the author's studies on avocado wilt (*Verticillium albo-atrum*) in California, two preliminary notices of which have already appeared [*R.A.M.*, 28, p. 580].

Merny (G.). **La maladie de Sigatoka du Bananier (Cercospora musae Zimm.) aux Antilles françaises.** [Sigatoka disease of Banana (*Cercospora musae* Zimm.) in the French West Indies.]—*Fruits d'Outre-Mer*, 4, 7, pp. 263–264, 1 map, 1949.

Banana leaf spot (*Cercospora musae*) [*Mycosphaerella musicola*: *R.A.M.*, 17, p. 759; 27, p. 412; 29, p. 35] is widespread in Guadeloupe and Martinique, where no banana-growing district is altogether unaffected. The disease is present, ranging from a few small spots to complete destruction of the foliage, in every plantation. Fortunately many groves become affected only at that stage of growth when the attack does not endanger yield, but the possibility that the disease may become more serious is always present. In both islands areas exposed to the winds from the sea are those least affected, the severest outbreaks occurring inland.

In Martinique the disease is very severe in the region of Champflore, in the interior. Rainfall here is very heavy (5 to 6 m. per year) and the soil becomes waterlogged owing to difficulties of drainage. Some of the affected plants are completely leafless and the bunches are poor and have not ripened when the rachis begins to rot. Equally severe outbreaks sometimes occur in the St Joseph–Gros Morne area, where the plantations are more dispersed than at Champflore, but lie mostly in sheltered valleys. On the Atlantic coast in the north of the island (Macouba, Basse-Pointe, Lorrain, Ste Marie) and also in the relatively dry south the outbreaks are of average severity, causing no alarm at present. The few plantations at Carbet and Prêcheur, where it is dry, are among the least affected of the whole island.

In Guadeloupe the banana plantations mostly lie along a narrow sea coast strip and in the path of the wind. Infection is fairly high, but the damage is less than at Champflore. At Capesterre, Trois Rivières, Dole, and Gourbeyre, where the coastline is steep, the outbreaks are generally moderate; in certain parts remote from the sea but of low elevation (Neufchâteau and Vernon) they are severe, but at 500 to 600 m. altitude (as at Parnasse, near St Claude) infection becomes insignificant.

The author advises that the bananas should be planted 2·5 by 3 m. apart and left with not more than two stalks per clump. Low-lying, sheltered areas and soils where drainage is difficult should be avoided. Spraying with copper fungicides as carried out by Leach in Jamaica is recommended [ibid., 26, p. 250] but the method requires to be adapted to the local conditions.

Pickett (A. D.). **A critique on insect chemical control methods.**—*Canad. Ent.*, 81, 3, pp. 1–10, 1 graph, 1949.

In considering insect pest control problems in Nova Scotia over a number of years the author thought that the early success of chemical control methods indicated the future complete removal of the orchard pest problem. Instead, the problem has intensified and a review of apple orchard insect control showed that of apple insects always present most of them had only recently become important. In the case of the oyster shell scale, *Lepidosaphes ulmi*, it was recorded as being an occasional pest in Nova Scotia for over 50 years but became important 15 years ago and killed and damaged many hundreds of apple trees. A survey showed that the insect was rarely a pest of any importance, although present in small numbers, on unsprayed trees and was most abundant on trees most thoroughly sprayed with sulphur compounds. Several applications of fungicide sprays are necessary for the control of apple scab [*Venturia inaequalis*] in Nova Scotia and it was a few years after 1930 when the mild sulphur sprays had come into prominent use that the scale population attained dangerous proportions. It has been found in experimental blocks that the oyster shell scale populations may be changed at will by varying the number of sulphur sprays applied. When copper or certain organic fungicides are substituted for sulphur the natural enemies of the scale increase and bring about its control.

A similar history respecting the European red spider, *Paratetranychus pilosus*, in apple orchards has been recorded. The average numbers at the peak of infestation each year from 1944 to 1947 on leaves sprayed with copper sprays only, were 16, 0·1, 2, and 46, respectively, and with mild sulphur sprays only, 170, 67, 166, and 309, respectively. The numbers were so high on the sulphur sprayed areas that by 1947 cumulative injury had seriously reduced the production of fruit. The increase is due to the fact that certain predators that feed on the spiders are destroyed by sulphur. The author thinks that the widespread, general use of chemicals, which may be highly toxic to a wide variety of species, is dangerous and may set up chain reactions. It is suggested, therefore, that instead of using chemicals which kill many species, an attempt should be made to discover those highly specific for particular pests. All chemicals used should be carefully studied to determine what general effects they have and all the natural factors involved in the environmental resistance to pests should be studied and utilized as fully as possible.

Ripper (W. E.). **Modern spraying machinery.**—*Brit. Fm Mechaniz.*, 1, 6, pp. 216–217, 2 figs., 1949.

In this paper (summarizing one read before the Institution of British Agricultural Engineers) the author describes and discusses recent advances and innovations in spraying equipment [*R.A.M.*, 26, p. 347]. The matters dealt with include corrosion and allied problems, lubrication, field fumigation equipment, fog generators

[ibid., 28, p. 296], atomizers, hot aerosols, the theory and use of dusting machines and their feed mechanisms, hydraulic sprayers, and helicopter dusting and spraying.

Feichtmeir (E. F.). **The effect of particle size and solubility of sulfur in carbon disulfide upon its toxicity to fungi.** –*Phytopathology*, 39, 8, pp. 605–615, 4 graphs, 1949.

Sulphur still maintains its importance as a plant-protective despite the commercial production of new synthetic compounds. In many respects its fungicidal action is not fully understood, and further work was therefore undertaken at the Shell Oil Company, Modesto, California. Attention was particularly directed to the relative potency of different allotropic forms and to the effect of variation in the method of preparation. Since it has long been known that the effect of sulphur is related to particle size [*R.A.M.*, 5, p. 311; 11, p. 385; 22, p. 486, *et passim*], a special effort was made to prepare samples of very homogeneous characteristics, using diameters of 1 to 2, 5 to 6, 11 to 12, and 15 to 16 μ, $\pm 1\,\mu$, separation of these narrow ranges being affected by means of liquid sedimentation.

With sulphur particles 1 to 2 μ in diameter the concentrations of carbon disulphide-insoluble and carbon disulphide-soluble sulphur, respectively, in μgm. per ml. for 50 per cent. reduction in germination or infection [ibid., 20, p. 544] were as follows: germination of conidia of *Sclerotinia fructicola* 3·9 and 13; of *Erysiphe graminis hordei* 0·6 and 2·1; protection of beans [*Phaseolus vulgaris*] against rust (*Uromyces appendiculatus*) 30 and 80; and against mildew (*E. polygoni*) 1·9 and 12.

The data show that carbon disulphide-insoluble sulphur has about three times the innate toxicity of the carbon disulphide-soluble, though this relationship may not obtain in the field.

The LD 50 values against conidia of *S. fructicola* for carbon disulphide-soluble sulphur particles of the above-mentioned diameters decreased directly with increase in the surface area per unit weight. The agglomeration of individual particles reduced their fungicidal efficacy. Large particles retained their protective capacity for a longer period than small ones. There was no significant difference between micronized and Raymond Mill-ground sulphur in toxicity to the four test organisms.

In exploratory tests an amorphous form with particles approximately 2 μ in diameter, produced by the evaporation of an acetone solution of sulphur, proved highly toxic to *S. fructicola* conidia, with an LD 50 of a 13 μgm. per sq. cm.

From the results of the study it may be concluded that the innate toxicity of sulphur may be increased by any factor (such as favourable allotropic form, higher temperature, smaller particle size, or increased dispersion) which increases the amount or rate of production of sulphur vapour.

McNew (G. L.) & Sundholm (N. K.). **The fungicidal activity of substituted pyrazoles and related compounds.**–*Phytopathology*, 39, 9, pp. 721–751, 1949.

A full account is given of the development, at the Agricultural Chemicals Research Laboratory, Naugatuck Chemical Division, United States Rubber Company, Bethany, Connecticut, of a remarkably effective group of new fungicides, the 4–nitrosopyrazoles. The maximum degree of efficiency was attained by the substitution of an aryl group in the 1-position of 3, 5–dimethyl–4–nitrosopyrazole.

The more active members of the series, e.g., J49 (1–*p*-chlorophenyl–3, 5–dimethyl–4–nitrosopyrazole) and 2K5 (1–*p*-tolyl–3, 5–dimethyl–4–nitrosopyrazole), prevent the germination of *Alternaria oleracea* [*A. brassicicola*] and *Sclerotinia americana* [*S. fructicola*] at concentrations as low as 0·1 p.p.m.; provide 95 per cent. protection against *A. solani* on tomato foliage at concentrations of 10 to 60 p.p.m. in spray suspension; give commercial control of apple scab (*Venturia*

inaequalis) at a dosage of 4 oz. per 100 gals. spray mixture; and equal or surpass the performance of standard commercial fungicides in the protection of pea, maize, spinach, and beet seed against [unspecified] soil organisms causing decay and damping-off. The compounds show, however, a tendency to cause dermatitis, and are rather expensive to manufacture.

CIFERRI (R.). **Metodi di controllo biologico degli anticrittogamici adottati in Italia.** [The methods adopted in Italy for carrying out biological tests of fungicides.] —Reprinted from *Conf. int. Engrais chim.*, Zürich, *1949*, 20 pp., 1949. [French, English, and German summaries.]

A review is given of some of the methods of testing fungicides now used in Italy [*R.A.M.*, 25, pp. 221, 223; 27, p. 483], comprising laboratory and phytotoxicity tests, and tests on plants experimentally infected. Phytotoxicity tests are made by spraying plants with the fungicides under examination, making tests of the absorption of the fungicide by the underground parts of plants, and experimenting with soil fumigants. Endotherapeutic tests are made to ascertain whether the fungicide is absorbed by the plant, and able to act in the different organs to which it is carried.

In conclusion, the author suggests that the testing of fungicides, as now carried on in Europe, should be simplified by the establishment of an International Committee to direct the work.

FOSTER (J. W.). **Chemical activities of fungi.**—xviii+648 pp., 8 figs., 11 diags., 14 graphs, New York, Academic Press Inc., 1949. $9.50.

This valuable treatise, designed primarily to meet the needs of advanced undergraduate and graduate students and also for scientific workers, covers the principal phenomena of transformations occurring in or brought about by the filamentous fungi. The author has integrated and evaluated, from the standpoint of comparative biochemistry, the field of mould metabolism, covering as well the historical background of the various phases. The chapters deal with history and perspective; methodology; the chemical nature of the mycelium; general considerations of mould metabolism; natural variation; mutations, physiological genetics, and biochemical synthesis; trace elements in the nutrition of fungi; lactic acid formation; alcoholic fermentation; oxalic acid metabolism; five chapters on other acids; carbohydrates; nitrogen metabolism; other transformations, and the microbiology of penicillin. Chapter 5 (pp. 184–208) on natural variation includes the prevention of physiological degeneration and restoration of cultures after degeneration. Chapter 6 (pp. 209–250) is concerned with spontaneous and all types of induced mutations. Comprehensive bibliographies appear at the end of each chapter and there are author and subject indexes at the end of the book.

American Type Culture Collection. Catalogue of cultures. Fifth edition. 1949.—127 pp., Washington, D.C., 2029 M Street, N.W., 1949.

The fifth edition of this catalogue of the micro-organisms maintained by the American Type Culture Collection [cf. *R.A.M.*, 18, p. 195], removed in 1947 to the above address, contains 2,975 strains, comprising 49 per cent. bacteria, 28 per cent. fungi, 16 per cent. yeasts. As well as the ATCC accession number of each strain, the name of the donor, his laboratory, the date on which the culture was deposited in the collection are given together with any other information. From January 1st, 1950, each culture will cost $10. A discount of 70 per cent. will be allowed to educational and charitable institutions and to those whose activities primarily concern the public welfare but a packing and posting charge of 35 cents for one culture and 50 cents for two or more will be made.

Heim (R.). **La mycothèque du Laboratoire de Cryptogamie du Muséum.** [The fungus collection at the Cryptogamic Laboratory of the Museum.]—Catalogues des Collections vivantes, Herbiers et Documents, Muséum Nationale d'Histoire Naturelle, Paris, 2, 60 pp., 13 pl., 2 figs., 1949.

This collection of Myxomycetes, Actinomycetes, and Eumycetes was founded with the intention of providing a source of living fungi for mycologists and physiologists resident in France. The author presents herein a preliminary list of 673 cultures of 503 species maintained at the National Museum of Natural History, Paris, together with notes on the preparation of culture media and the techniques employed, and on various studies made in the laboratory.

Centraalbureau voor Schimmelcultures. Supplementary list of cultures 1949.—11 [unnumbered] pp., 1949. [Mimeographed.]

This is a supplementary list of fungus cultures deposited at the Centraalbureau voor Schimmelcultures [Baarn, Holland: *R.A.M.*, 24, p. 377] up to 12th October, 1949. Species of *Pestalotiopsis* as revised by Steyaert [ibid., 28, p. 489] are included.

Miller (P. R.) & Nance (Nellie). **Preliminary estimates of acreages of crop lands in the United States infested with some organisms causing plant diseases.**—*Plant Dis. Reptr, Suppl.* 185, pp. 207–252, 4 maps, 1949. [Mimeographed.]

Lists (based on data received from the Chief Collaborator of the Plant Disease Survey in each of 28 States) are presented showing the estimated potential acreage of crop land in the different States of the American Union infected with various important diseases. The list for each disease organism gives the common name of the host plants (in alphabetical order) and under these the State reporting, the acreage affected by the disease, and brief pertinent remarks. The disease organisms dealt with comprise *Fusarium*, *Rhizoctonia* (chiefly *R.* [*Corticium*] *solani*), *Sclerotinia sclerotiorum*, *Verticillium*, *Phymatotrichum omnivorum*, *Heterodera marioni* and nematodes other than those causing root knot, and other organisms. Maps illustrate the estimated acreages infested with *Fusarium* species pathogenic to potato, tomato, and watermelon, and those infested with *Rhizoctonia* pathogenic to potato.

Of the important information provided one or two examples may briefly be cited. It is estimated that in Kansas over 75 per cent. of the land used for commercial cabbage production is infected with cabbage yellows *Fusarium* [*F. conglutinans*: cf. *R.A.M.*, 27, p. 591], though losses have not been serious recently, because of the cultivation of resistant varieties [ibid., 28, p. 103]. Also in Kansas, 3,154,000 acres are potentially affected with maize pink rot (*F. moniliforme*) [*Gibberella fujikuroi*: cf. ibid., 25, p. 406; 27, pp. 278, 510]. In Georgia, 2,000,000 acres of cotton are potentially affected with *Fusarium* [*F. vasinfectum*: cf. ibid., 28, p. 286] and this area is probably increasing. Wilt is present throughout southern Georgia and occurs in most sandy parts in the north. In Arkansas, 159,335 acres of cotton are potentially affected by *Verticillium* [*V. albo-atrum* and *V. dahliae*: cf. ibid., 28, p. 573]. Incidence varies greatly according to the weather conditions. *Verticillium* is believed to be present in most Arkansas soils, as cotton growing in the north-west of the State in land not before used for this host has become affected. In Oklahoma 600,000 acres of crop land (2 per cent. of farm land) are potentially infected by *P. omnivorum* [cf. ibid., 27, pp. 185, 28, p. 287] and in Texas 1,300,000 acres. In Kansas, figures based on the 1948 crop show that 80 per cent. of the area under lucerne is affected by *Corynebacterium insidiosum* [cf. ibid., 27, p. 121; 28, pp. 18, 577].

Moore (W. C.). **Plant diseases in the United Kingdom.**—United Nations Economic & Social Council, E/Conf. 7/Sec/W. 52, 8 pp., 1949. [Mimeographed.]

In this paper (prepared for the United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, 17th August—6th September, 1949) the author draws attention to the chief advances in plant disease control in the United Kingdom in recent years and gives figures illustrating the extent of loss due to disease, the cost of control, and the advantages secured [cf. *R.A.M.*, 28, p. 345]. Brief details are given of the use of organo-mercury dusts for the disinfection of cereal seed against *Tilletia caries*, *Ustilago hordei*, and *Helminthosporium* spp., of sugar beet seed to improve emergence, and of pea seed against pre-emergence damping-off [ibid., 23, p. 53]; of tetramethylthiuramidisulphide for the seed disinfection of flax and linseed against diseases in general [ibid., 28, p. 215], of mercurous chloride for the control of onion white rot (*Sclerotium cepivorum*) [ibid., 26, p. 477], copper compounds and haulm killing against potato blight (*Phytophthora infestans*) [ibid., 26, p. 561; 28, p. 479], and tetrachloronitrobenzene against potato dry rot (*Fusarium* spp.) [ibid., 28, p. 641] and premature sprouting in storage.

Reference is made to health certification schemes for potatoes, soft fruits, and hops [ibid., 28, pp. 340, 341]. Emphasis is laid on the importance of rotation against soil-borne diseases, and a note is given on an unprecedented outbreak of cereal take-all (*Ophiobolus graminis*) in England in 1948 [ibid., 28, p. 281].

Moreau (C.). **Les maladies parasitaires des principales cultures coloniales. Revue bibliographique. III.** [The parasitic disorders of the principal colonial crops. Bibliographical review. III.]—*Rev. Mycologie, Suppl. colon.*, 14, 1, pp. 23–36, 1949.

In this third review [cf. *R.A.M.*, 28, p. 472] the author gives notes from the literature published from 1947 to 1949 on the principal diseases of citrus, pineapples, groundnuts, bananas, cacao, coffee, sugar-cane, cotton, rubber, palms, rice, and tea, followed by miscellaneous notes. A bibliography of 86 titles is appended.

Oosterhuis (H. K.). **Antibiotics from molds.**—*Meded. Lab. physiol. Chem. Univ. Amst., 1945–47*, 1, 116 pp. [? 1948. English summary. Abs. in *Chem. Abstr.*, 43, 20, p. 8003, 1949.]

'Expansin', an antibiotic substance isolated from *Penicillium expansum* [*R.A.M.*, 25, p. 409], has now been proved to be identical with claviformin [ibid., 26, p. 23], clavacin [ibid., 27, pp. 203, 488], and patulin [ibid., 28, p. 26].

Gäumann (E.). **Die Pilze. Grundzüge ihrer Entwicklungsgeschichte und Morphologie.** [Fungi. Characteristic features of their phylogeny and morphology.]—382 pp., 426 figs., 14 diags., Basel, Verlag Birkhäuser, 1949. Swiss fr. 34 in paper cover, fr. 38 bound.

In this text book the author seeks to present in an abridged form the essential facts in the phylogeny and morphology of the fungi [cf. *R.A.M.*, 7, p. 591]. Four classes are recognized, namely, the Archimycetes, Phycomycetes, Ascomycetes, and Basidiomycetes, of which the first is only briefly described and discussed on practical grounds, dictated by the demands of phytopathology. The Archimycetes (comprising the Olpidiaceae, Synchytriaceae, Plasmodiophoraceae, and Olpidiopsidaceae) are considered to have remained at a low phylogenetic level, and to represent for the most part flagellates with an acquired parasitic habit. In contrast to the naked vegetative body of the Archimycetes that of the true fungi normally consists of hyphae surrounded by cell walls. These organisms appear to have lost their assimilative pigment through mutation, while many have no auxin-

synthesizing properties and require a supply of growth substances from external sources.

Keys are provided to the major groups and to the families, and in some groups (rusts and smuts) to the genera. A single-page appendix treats of the Fungi Imperfecti and a 10-page bibliography is provided.

CORNER (E. J. H.). **Studies in the basidium. I. The ampoule effect, with a note on nomenclature.**—*New Phytol.*, 47, 1, pp. 22–51, 8 figs., 1 graph, 1948. [Received November, 1949.]

The development of a basidium is described in detail using *Oudemansiella* (*Collybia*) *canarii* as a type. It is regarded as a self-charged ampoule containing dense protoplasm and a basal vacuole which enlarges and injects the former into the spores. Proof of the relation of basidium volume to number and volume of spores in a wide range of types is given and anomalies explained by disturbances in the normal ampoule effect.

PETERS (ILSE) & RIPPEL-BALDES (A.). **Über das Vorkommen verschiedener Rassen von Aspergillus niger van Tiegh. im Boden.** [On the occurrence of various races of *Aspergillus niger* van Tiegh. in the soil.]—*Arch. Mikrobiol.*, 14, 2, pp. 203–211, 1 fig., 1 diag., 1949.

The race of *Aspergillus niger* occurring in south Germany and elsewhere in southern Europe, especially in dry turf [*R.A.M.*, 19, p. 566], as well as in tropical soils, is characterized by a sparse, slightly wavy aerial mycelium and very copious sporulation, in contrast to the forms collected at higher altitudes and in forests in the south, and in central and north Germany, with their meagre spore production and more or less abundant mycelium.

Purely sclerotial strains, hitherto known only in the tropics, were isolated from German soils in the course of these studies. They either lost their capacity for the formation of sclerotia after subculturing a few times or produced them at a lower minimum temperature than the tropical strains.

Strains of diverse origin showed no difference in efficiency as citric and oxalic acid-producers, but fresh isolates gave higher yields than those maintained for eight years in the laboratory.

LANSADE (M.). **Recherches sur la fusariose ou pourriture sèche de la Pomme de terre, Fusarium caeruleum (Lib.) Sacc.** [Researches on fusariosis or dry rot of the Potato, *Fusarium caeruleum* (Lib.) Sacc.]—*Bull. tech. Inform. Ingén. Serv. agric., 1949*, 41, pp. 419–432, 7 figs., 4 graphs, 1949.

Biological studies on *Fusarium caeruleum* [*R.A.M.*, 26, p. 285; 28, p. 641], which has recently caused severe losses of Bintje potatoes in France, showed that in water at 18° to 20° C. the spores germinate in three to five hours. At lower temperatures germination is slower and at temperatures over 30° it becomes arrested. Damp spores are killed in ten minutes at 45°, and the chlamydospores are inactivated at 47·5° to 48°, though in dry conditions they withstand temperatures up to 70° or 75°. The growth of the mycelium in pure culture and in the tuber is optimum at 17° to 18°. Bintje tubers, unsuitable for the development of *F. caeruleum* as long as they are growing in the soil, retain their resistance during the first few months' storage, after which susceptibility increases, rapidly reaching a maximum. The Saucisse variety, on the other hand, does not become susceptible until May or June. Resistance is a varietal character. During the mobilization of reserves, susceptibility varies greatly. Turgescence is a factor in resistance, a correlation being found between loss of weight and susceptibility.

Tubers dug early, those with a thin skin, and those wounded or cut dry up more

rapidly and as a rule become more susceptible than tubers dug late and possessing a thick, unbroken skin. Some soils appear to induce an exceptional degree of susceptibility.

Tubers should not be stored in hot, dry conditions. A low storage temperature appreciably retards the development of the disease. Planting should be effected early, in a moist soil. Storage places and materials should be disinfected with 7 to 10 per cent. cresol, 5 per cent. formalin, or a strong dosage of sulphur dioxide. Saucisse, Rosa, Voran, Richter's Jubel, and Primula show resistance, but cannot replace Bintje.

Digest of plant quarantine regulations.—52 pp., Food and Agriculture Organisation of the United Nations, Washington, D.C., 1949. [Mimeographed.]

This digest is a summary of official documents submitted to FAO by the 22 respective member countries, giving existing legislation relating to regulatory and quarantine matters in the field of plant health. Legislation, prohibited and restricted imports, and general regulations are given for each country.

Distribution Maps of Plant Diseases.—Maps 169–192. Issued by the Commonwealth Mycological Institute, 1949. 3*s.* 9*d.*

The eighth year's issue of this series of maps showing the world distribution of major crop diseases [*R.A.M.*, 28, p. 96] comprises (No. 169) *Botrytis allii* on *Allium* spp., (170) *B. tulipae* on tulip, (171) *Phytophthora richardiae* on *Zantedeschia aethiopica*, (172) *Cercospora nicotianae* on tobacco, (173) *Neovossia indica* on wheat, (174) *P. syringae* on lilac, etc., (175) *Helminthosporium torulosum* on banana, Manila hemp, etc., (176) *Fomes lignosus* on *Hevea* rubber and other plants, (177) *Colletotrichum lindemuthianum* on beans, (178) tomato bushy stunt virus on tomato, (179) *Sclerospora sorghi* on sorghum, maize, etc., (180) *Plowrightia ribesia* on currant and gooseberry, (181) *Puccinia psidii* on guava, pimento, etc., (182) *Polyporus schweinitzii* on pine, spruce, etc., (183) *Cycloconium oleaginum* on olive, (184) cassava mosaic virus on cassava, (185) *Leptosphaeria coniothyrium* on rose (*Rosa* spp.), raspberry, etc., (186) *Physalospora tucumanensis* on sugar-cane, (187) *Pseudopeziza ribis* on currant, gooseberry, (188) *Clasterosporium carpophilum* on peach, almond, etc., (189) *Mycosphaerella brassicicola* on cabbage, cauliflower, etc., (190) *Colletotrichum atramentarium* on potato, tomato, (191) *Gibberella fujikuroi* var. *subglutinans* on maize, sorghum, and other plants, and (192) *Taphrina deformans* on peach, almond, and nectarine.

Nursery stock, plant, and seed quarantine (No. 37). Hearing set for November 18 to consider limiting entry of imported nursery stock.—*S.R.A., B.E.P.Q., U.S. Dep. Agric.*, 170, pp. 116–118, 1948.

This announcement concerns a suggested revision of Quarantine No. 37 [*R.A.M.*, 26, p. 368] whereby importation of nursery stock from foreign countries may be limited, restricted to designated inspection stations, or grown under post-entry quarantine. Importation of certain species or classes of woody plants may be limited to seeds only, and the entry of known host plants of certain diseases from affected countries restricted or prohibited. Among 35 injurious insects and plant diseases suggested as warranting such measures are the following fungus pathogens: *Physalospora piricola* [ibid., 26, p. 345], *Stereum hiugense* [ibid., 19, p. 238], *Pestalotia disseminata*, a leaf parasite of *Eucalyptus* in Portugal and Uruguay, *Stegophora aemula* [ibid., 16, p. 343], *Vialina radicicola* [ibid., 15, p. 135], *Mycosphaerella aleuritidis* [ibid., 15, p. 633; 21, p. 55], *Fusarium fuliginosporum* [ibid., 14, p. 680], and *Taphrina armeniaca*, which causes a witches' broom disease of apricots in Rumania.